

THE
COLUMBIAN
CYCLOPEDIA

THIRTY-TWO VOLUMES

VOL 11.

EPAMINONDAS—FISCAL

WITH ILLUSTRATIONS

BUFFALO, N. Y.
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SCHEME OF SOUND SYMBOLS

FOR THE PRONUNCIATION OF WORDS.

Note.—(·) is the mark dividing words respelt phonetically into syllables; (ˈ), the accent indicating on which syllable or syllables the accent or stress of the voice is to be placed.

Sound-symbols employed in Respelling.	Representing the Sounds as exemplified in the Words.	Words respelt with Sound-symbols and Marks for Pronunciation.
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<i>ā</i> ...	mate, fate, fail, aye.....	<i>māt, fāt, fāl, ā.</i>
<i>ă</i> ...	mat, fat.....	<i>măt, făt.</i>
<i>ā</i> ...	far, calm, father.....	<i>fār, kām, fā thēr.</i>
<i>ă</i> ...	care, fair.....	<i>cār, fār.</i>
<i>aw</i> ...	fall, laud, law.....	<i>fawl, lawd, law.</i>
<i>ē</i> ...	mete, meat, feet, free.....	<i>mēt, mēt, fēt, frē.</i>
<i>ĕ</i> ...	met, bed.....	<i>mĕt, bĕd.</i>
<i>ê</i> ...	her, stir, heard, cur.....	<i>hēr, stēr, hĕrd, kēr.</i>
<i>ī</i> ...	pine, ply, height.....	<i>pīn, plī, hīt.</i>
<i>î</i> ...	pin, nymph, ability.....	<i>pīn, nīmḡ, ā-bīl'î-tī.</i>
<i>ō</i> ...	note, toll, soul.....	<i>nōt, tōl, sōl.</i>
<i>ö</i> ...	not, plot.....	<i>nōt, plōt.</i>
<i>ô</i> ...	move, smooth.....	<i>mōv, smōth.</i>
<i>ö</i> ...	Goethe (similar to <i>e</i> in her)...	<i>gō tēh.</i>
<i>ow</i> ...	noun, bough, cow.....	<i>noun, bow, kow.</i>
<i>oy</i> ...	boy, boil.....	<i>boy, boyl.</i>
<i>ū</i> ...	pure, dew, few.....	<i>pūr, dū, fū.</i>
<i>û</i> ...	bud, come, tough.....	<i>būd, kûm, tûf.</i>
<i>û</i> ...	full, push, good.....	<i>fûl, pûsh, gûd.</i>
<i>ü</i> ...	French plume, Scotch guid.....	<i>plüm, gûd.</i>

ch...chair, match..... *chär, mäch.*

ch...German buch, Heidelberg,

Scotch loch (guttural)..... *böch, hī dēl-bērčh, löch.*

g...game, go, gun..... *gām, gō, gūn.*

ǵ...judge, gem, gin..... *jūǵ, jēm, jīn.*

k...king, cat, cot, cut..... *kīng, kăt, kôt, kût.*

s...sit, scene, cell, city, cypress..... *sīt, sēn, sēl, sīt'ē, sī'prēs.*

sh...shun, ambition..... *shūn, ām-bīsh'ūn.*

th...thing, breath..... *thīng, brēth.*

th...though, breathe..... *thō, brēth.*

z...zeal, maze, muse..... *zēl, māz, mūz.*

zh...azure, vision..... *āzh'ēr, vīzh'ūn.*

ABBREVIATIONS USED IN THIS WORK.

a., or adj.....adjective	A.U.C.....in the year of the building of the city (Rome) [<i>Annourbis conditæ</i>]
A.B.....Bachelor of Arts	Aug.....August
abbr.....abbreviation, abbrevi- vated	aug.....augmentative
abl. or abla.ablative	Aust.....Austrian
Abp.....Archbishop	A. V.....authorized version [of Bible, 1611]
abt.....about	avoir.....avoirdupois
Acad.....Academy	B.....Boron
acc. or ac.....accusative	B.....Britannic
accom.....accommodated, ac- commodation	b.....born
act.....active	Ba.....Barium
A.D.....in the year of our Lord [<i>Anno Dom- ini</i>]	Bart.....Baronet
Adj.Adjutant	Bav.....Bavarian
Adm.....Admiral	bl.; bbl.....barrel; barrels
adv. or ad.adverb	B.C.....before Christ
A. F.....Anglo-French	B.C.L.....Bachelor of Civil Law
Ag.....Silver [<i>Argentum</i>]	B.D.....Bachelor of Divinity
agri.....agriculture	bef.....before
A. L.....Anglo-Latin	Belg.....Belgic
Al.....Aluminium	Beng.....Bengali
Ala.....Alabama	Bi.....Bismuth
Alb.....Albanian	biog.....biography, biograph- ical
alg.....algebra	biol.....biology
A.M.....before noon [<i>ante meridiem</i>]	B.L.....Bachelor of Laws
A.M.....Master of Arts	Bohem.....Bohemian
Am.....Amos	bot.....botany, botanical
Amer.....America, -n	Bp.....Bishop
anat.....anatomy, anatomical	Br.....Bromine
anc.....ancient, anciently	Braz.....Brazilian
AN. M.in the year of the world [<i>Anno Mundi</i>]	Bret.....Breton
anon.....anonymous	Brig.....Brigadier
antiq.....antiquity, antequil- ties	Brit.....British, Britannica
aor.....aorist, -ic	bro.....brother
app.....appendix	Bulg.....Bulgarian
appar.....apparently	bush.....bushel, bushels
Apr.....April	C.....Carbon
Ar.....Arabic	c.....century
arch.....architecture	Ca.....Calcium
archæol.....archæology	Cal.....California
arith.....arithmetic	Camb.....Cambridge
Ariz.....Arizona	Can.....Canada
Ark.....Arkansas	Cant.....Canterbury
art.....article	cap.....capital
artil.....artillery	Capt.....Captain
AS.....Anglo-Saxon	Card.....Cardinal
As.....Arsenic	carp.....carpentry
Assoc.....Association	Cath.....Catholic
asst.....assistant	caus.....causative
astrol.....astrology	cav.....cavalry
astron.....astronomy	Cd.....Cadmium
attrib.....attributive	Ce.....Cerium
atty.....attorney	Celt.....Celtic
at. wt.....atomic weight	cent.....central
Au.....Gold [<i>Aurum</i>]	cf.....compare [<i>confer</i>]
	ch or chh.....church

ABBREVIATIONS.

Chal.....Chaldee
 chap.....chapter
 chem.....chemistry, chemical
 Chin.....Chinese
 Chron.....Chronicles
 chron.....chronology
 Cl.....Chlorine
 Class.....Classical [= Greek
 and Latin]
 Co.....Cobalt
 Co.....Company
 co.....county
 cog.....cognate [with]
 Col.....Colonel
 Col.....Colossians
 Coll.....College
 colloq.....colloquial
 Colo.....Colorado
 Com.....Commodore
 com.....commerce, commer-
 cial
 com.....common
 comp.....compare
 comp.....composition, com-
 pound
 compar.....comparative
 conch.....conchology
 cong.....congress
 Congl.....Congregational
 conj.....conjunction
 Conn or Ct.....Connecticut
 contr.....contraction, con-
 tracted
 Cop.....Coptic
 Cor.....Corinthians
 Corn.....Cornish
 corr.....corresponding
 Cr.....Chromium
 crystal.....crystallography
 Cs.....Cæsium
 ct.....cent
 Ct. or Conn.....Connecticut
 Cu.....Copper [*Cuprum*]
 cwt.....a hundred weight
 Cyc.....Cyclopedia
 D.....Didymium
 D. or Dut.....Dutch
 d.....died
 d. [l. s. d.].....penny, pence
 Dan.....Daniel
 Dan.....Danish
 dat.....dative
 dau.....daughter
 D. C.....District of Columbia
 D.C.L.....Doctor of Civil [or
 Common] Law
 D.D.....Doctor of Divinity
 Dec.....December
 dec.....declension
 def.....definite, definition
 deg.....degree, degrees
 Del.....Delaware
 del.....delegate, delegates
 dem.....democratic
 dep.....deputy
 dep.....deponent
 dept.....department
 deriv.....derivation, deriva-
 tive
 Deut.....Deuteronomy
 dial.....dialect, dialectal
 diam.....diameter
 Dic.....Dictionary

diff.....different, difference
 dim.....diminutive
 dist.....district
 distrib.....distributive
 div.....division
 doz.....dozen
 Dr.....Doctor
 dr.....dram, drams
 dram.....dramatic
 Dut. or D.....Dutch
 dwt.....pennyweight
 dynam or
 dyn.....dynamics
 E.....Erbium
 E. or e.....East, -ern, -ward
 E. or Eng.....English
 Eccl.....Ecclesiastes
 eccl. or { ecclesiastical [af-
 eccles..... { fairs]
 ed.....edited, edition, edi-
 tor
 e.g.....for example [*ex*
gratia]
 E. Ind. or { East Indies, East
 E. I..... { Indian
 elect.....electricity
 Emp.....Emperor
 Encyc.....Encyclopedia
 Eng. or E.....English
 engin.....engineering
 entom.....entomology
 env. ext.....envoy extraordinary
 ep.....epistle
 Eph.....Ephesians
 Episc.....Episcopal
 eq. or =.....equal, equals
 equiv.....equivalent
 esp.....especially
 Est.....Esther
 estab.....established
 Esthon.....Esthonian
 etc.....and others like [*et*
cetera]
 Eth.....Ethiopic
 ethnog.....ethnography
 ethno.....ethnology
 et seq.....and the following
 [*et sequentia*]
 etym.....etymology
 Eur.....European
 Ex.....Exodus
 exclam.....exclamation
 Ezek.....Ezekiel
 Ezr.....Ezra
 F.....Fluorine
 F. or Fahr.....Fahrenheit
 f. or fem.....feminine
 F. or Fr.....French
 fa.....father
 Fahr. or F.....Fahrenheit
 far.....farriery
 Fe.....Iron [*Ferrum*]
 Feb.....February
 fem or f.....feminine
 fig.....figure, figuratively
 Fin.....Finnish
 F.—L.....French from Latin
 Fla.....Florida
 Flem.....Flemish
 for.....foreign
 fort.....fortification
 Fr. or F.....French
 fr.....from

ABBREVIATIONS.

freq.....frequentative
Fris.....Frisian
ft.....foot, feet
fut.....future
G. or Ger...German
G.....Glucinium
Ga.....Gallium
Ga.....Georgia
Gael.....Gaelic
Gal.....Galatians
gal.....gallon
galv.....galvanism, galvanic
gard.....gardening
gen.....gender
Gen.....General
Gen.....Genesis
gen.....genitive
Geno.....Genoese
geog.....geography
geol.....geology
geom.....geometry
Ger.....German, Germany
Goth.....Gothic
Gov.....Governor
govt.....government
Gr.....Grand, Great
Gr.....Greek
gr.....grain, grains
gram.....grammar
Gr. Brit...Great Britain
Gris.....Grisons
gun.....gunnery
H.....Hegira
H.....Hydrogen
h.....hour, hours
Hab.....Habakkuk
Hag.....Haggai
H. B. M....His [or Her] Britan-
 nic Majesty
Heb.....Hebrew, Hebrews
her.....heraldry
herpet...herpetology
Hg.....Mercury [*Hydrar-*
 gyrum]
hhd.....hogshead, hogsheads
Hind.....Hindustani, Hindu,
 or Hindi
hist.....history, historical
Hon.....Honorable
hort.....horticulture
Hos.....Hosea
Hung.....Hungarian
Hydros...Hydrostatics
I.....Iodine
I; Is.....Island; Islands
Icel.....Icelandic
ichth...ichthyology
Ida.....Idaho
i.e......that is [*id est*]
Ill.....Illinois
illus...illustration
impera or
 impr.....imperative
impers...impersonal
impf or imp imperfect
impf. p. or
 imp.....imperfect participle
improp...improperly
In.....Indium
in.....inch, inches
incept...inceptive
Ind.....India, Indian
Ind.....Indiana

ind.....indicative
indef...indefinite
Indo-Eur...Indo-European
inf.....infantry
inf or infin infinitive
instr.....instrument, -al
int.....interest
intens...intensive
interj. or
 int.....interjection
interrog...interrogative **pro-**
 noun
intr. or
 intrans...intransitive
Io.....Iowa
Ir.....Iridium
Ir.....Irish
Iran.....Iranian
irr.....irregular, -ly
Is.....Isaiah
It.....Italian
Jan.....January
Jap.....Japanese
Jas.....James
Jer.....Jeremiah
Jn.....John
Josh.....Joshua
Jr.....Junior
Judg.....Judges
K.....Potassium [*Kalium*]
K.....Kings [in Bible]
K.....king
Kan.....Kansas
Kt.....Knight
Ky.....Kentucky
L.....Latin
L.....Lithium
l. [l. s. d.], { pound, pounds
 or £......} [sterling]
La.....Lanthanum
La.....Louisiana
Lam.....Lamentations
Lang.....Languedoc
lang.....language
Lap.....Lapland
lat.....latitude
lb.; lb. or { pound; pounds
 lbs......} [weight]
Let.....Lettish
Lev.....Leviticus
LG.....Low German
L.H.D....Doctor of Polite Lit-
 erature
Lieut...Lieutenant
Lim.....Limousin
Lin.....Linnaeus, Linnæan
lit.....literal, -ly
lit.....literature
Lith.....Lithuanian
lithog...lithograph, -y
LL.....Late Latin, Low
 Latin
LL.D....Doctor of Laws
long.....longitude
Luth.....Lutheran
M.....Middle
M.....Monsieur
m.....mile, miles
m. or masc. masculine
M.A......Master of Arts
Macc.....Maccabees
mach...machinery
Mag.....Magazine

ABBREVIATIONS.

Maj......Major
Mal......Malachi
Mal......Malay, Malayan
manuf......manufacturing, manufacturers
Mar......March
masc or m......masculine
Mass......Massachusetts
math......mathematics, mathematical
Matt......Matthew
M.D......Doctor of Medicine
MD......Middle Dutch
Md......Maryland
ME......Middle English, or Old English
Me......Maine
mech......mechanics, mechanical
med......medicine, medical
mem......member
mensur......mensuration
Messrs. or
MM......Gentlemen, Sirs
metal......metallurgy
metaph......metaphysics, metaphysical
meteor......meteorology
Meth......Methodist
Mex......Mexican
Mg......Magnesium
M.Gr......Middle Greek
MHG......Middle High German
Mic......Micah
Mich......Michigan
mid......middle [voice]
Milan......Milanese
mid. L. or } Middle Latin, Medieval
ML......{ Latin
milit. or
mil......military [affairs]
min......minute, minutes
mineral......mineralogy
Minn......Minnesota
Min. Plen......Minister Plenipotentiary
Miss......Mississippi
ML. or } Middle Latin, Medieval
mid. L......{ Latin
MLG......Middle Low German
Mlle......Mademoiselle
Mme......Madam
Mn......Manganese
Mo......Missouri
Mo......Molybdenum
mod......modern
Mont......Montana
Mr......Master [Mister]
Mrs......Mistress [Missis]
MS.; MSS......manuscript; manuscripts
Mt......Mount, mountain
mus......music
mus.doc......Doctor of Music
myth......mythology, mythological
N......Nitrogen
N. or n......North, -ern, -ward
n......noun
n or neut......neuter
Na......Sodium [*Natrium*]
Nah......Nahum

N. A., or
N. Amer......North America, -n
nat......natural
naut......nautical
nav......navigation, naval affairs
Nb......Niobium
N. C. or
N. Car......North Carolina
N. D......North Dakota
Neb......Nebraska
neg......negative
Neh......Nehemiah
N. Eng......New England
neut or n......neuter
Nev......Nevada
N.Gr......New Greek, Modern Greek
N. H......New Hampshire
NHG......New High German [German]
Ni......Nickel
N. J......New Jersey
NL......New Latin, Modern Latin
N. Mex......New Mexico
N. T., or
N. Test......New Testament
N. Y......New York [State]
nom......nominative
Norm. F......Norman French
North. E......Northern English
Norw......Norwegian, Norse
Nov......November
Num......Numbers
numis......numismatics
O......Ohio
O......Old
O......Oxygen
Obad......Obadiah
obj......objective
obs. or †......obsolete
obsoles......obsolescent
O.Bulg......Old Bulgarian or Old Slavic
Oct......October
Odontog......odontology
OE......Old English
OF or
O. Fr......Old French
OHG......Old High German
Ont......Ontario
opt......optics, optical
Or......Oregon
ord......order
ord......ordnance
org......organic
orig......original, -ly
ornith......ornithology
Os......Osmium
OS......Old Saxon
O. T., or
O. Test......Old Testament
Oxf......Oxford
oz......ounce, ounces
P......Phosphorus
p.; pp......page; pages
p., or part......participle
Pa. or Penn......Pennsylvania
paint......painting
palæon......palæontology
parl......parliament
pass......passive

ABBREVIATIONS.

pathol or
 path.....pathology
 Pb.....Lead [*Plumbum*]
 Pd.....Palladium
 Penn or Pa. Pennsylvania
 perf.....perfect
 perh.....perhaps
 Pers.....Persian, Persic
 pers.....person
 persp.....perspective
 pert.....pertaining [to]
 Pet.....Peter
 Pg. or Port. Portuguese
 phar.....pharmacy
 PH.D.....Doctor of Philoso-
 phy
 Phen.....Phenician
 Phil.....Philippians
 Philem.....Philemon
 philol.....philology, philologi-
 cal
 philos. { philosophy, philo-
 or phil... } sophical
 phonog.....phonography
 photog.....photography
 phren.....phrenology
 phys.....physics, physical
 physiol.....physiology, phys-
 iological
 Pied.....Piedmontese
 Pl.....Plate
 pl. or plu.....plural
 Pl. D.....Platt Deutsch
 plupf.....pluperfect
 P.M.....afternoon [*post meri-
 diem*]
 pneum.....pneumatics
 P. O.....Post-office
 poet.....poetical
 Pol.....Polish
 pol. econ.....political economy
 polit.....polities, political
 pop.....population
 Port. or Pg. Portuguese
 poss.....possessive
 pp.....pages
 pp.....past participle, per-
 fect participle
 p. pr.....present participle
 Pr. or Prov. Provengal
 pref.....prefix
 prep.....preposition
 Pres.....President
 pres.....present
 Presb.....Presbyterian
 pret.....preterit
 prim.....primitive
 priv.....privative
 prob.....probably, probable
 Prof.....Professor
 pron.....pronoun
 pron.....pronunciation, pro-
 nounced
 prop.....properly
 pros.....prosody
 Prot.....Protestant
 Prov. or Pr. Provengal
 Prov.....Proverbs
 prov.....province, provincial
 Prov. Eng. Provincial English
 Prus.....Prussia, -n
 Ps.....Psalm, Psalms
 psychol.....psychology

pt.....past tense
 pt.....pint
 Pt.....Platinum
 pub.....published, publisher,
 publication
 pwt.....pennyweight
 Q.....Quebec
 qt.....quart
 qtr.....quarter [weight]
 qu.....query
 Q.V.....which see [*quod
 vide*]
 R.....Rhodium
 R.....River
 Rb.....Rubidium
 R. Cath.....Roman Catholic
 rec. sec.....recording secretary
 Ref.....Reformed
 refl.....reflex
 reg.....regular, -ly
 regt.....regiment
 rel. pro. or
 rel.....relative pronoun
 repr.....representing
 repub.....republican
 Rev.....Revelation
 Rev.....The Reverend
 Rev. V.....Revised Version
 rhet.....rhetoric, -al
 R. I.....Rhode Island
 R. N.....Royal Navy
 Rom.....Roman, Romans
 Rom.....Romanic or Ro-
 mance
 Rom. Cath. { Roman Catholic
 Ch. or R. } Church
 C. Ch....
 r.r.....railroad
 Rt. Rev.....Right Reverend
 Ru.....Ruthenium
 Russ.....Russian
 r.w.....railway
 S.....Saxon
 S.....Sulphur
 s.....second, seconds
 s. [l. s. d.]..shilling, shillings
 S. or s.....South, -ern, -ward
 S. A. or
 S. Amer..South America, -n
 Sam.....Samaritan
 Sam.....Samuel
 Sans, or
 Skr.....Sanskrit
 Sb.....Antimony [*Stibium*]
 s.c.....understand, supply,
 namely [*scilicet*]
 S. C. or
 S. Car...South Carolina
 Scand.....Scandinavian
 Scot.....Scotland, Scotch
 scr.....scruple, scruples
 Scrip.....Scripture [s], Scrip-
 tural
 sculp.....sculpture
 S. D.....South Dakota
 Se.....Selenium
 sec.....secretary
 sec.....section
 Sem.....Semitic
 Sep.....September
 Serv.....Servian
 Shaks.....Shakespeare
 Si.....Silicon

ABBREVIATIONS.

Sic.....	Sicilian	trigon.....	trigonometry
sing.....	singular	Turk.....	Turkish
sis.....	sister	typog.....	typography, typo-
Skr. or			graphical
Sans.....	Sanskrit	U.....	Uranium
Slav.....	Slavonic, Slavic	ult.....	ultimate, -ly
Sn.....	Tin [<i>Stannum</i>]	Unit.....	Unitarian
Soc.....	Society	Univ.....	Universalist
Song Sol...	Song of Solomon	Univ.....	University
Sp.....	Spanish	U. Presb...	United Presbyterian
sp. gr.....	specific gravity	U. S....	United States
sq.....	square	U. S. A....	United States Army
Sr.....	Senior	U. S. N....	United States Navy
Sr.....	Strontium	Ut.....	Utah
St.: Ste....	Saint	V.....	Vanadium
St....	street	v.....	verb
stat.....	statute	Va.....	Virginia
s.t.d.....	Doctor of Sacred Theology	var.....	variant [word]
subj.....	subjunctive	var.....	variety of [species]
suf.....	suffix	Ven.....	Venerable
Su. Goth...	Suo-Gothic	Venet.....	Venetian
superl.....	superlative	vet.....	veterinary
Supp.....	Supplement	v. i. or	
Supt.....	Superintendent	v. intr....	verb intransitive
surg.....	surgery, surgical	vil.....	village
Surv.....	surveying	viz.....	namely, to-wit [<i>vide-</i> <i>licet</i>]
Sw.....	Swedish	v. n.....	verb neuter
Swab.....	Swabian	voc.....	vocative
sym.....	symbol	vol.....	volume
syn.....	synonym, -y	vols.....	volunteers
Syr.....	Syriac, Syrian	Vt.....	Vermont
t.....	town	v. tr.....	verb transitive
Ta....	Tantalum	W.....	Tungsten [<i>Wolfram</i>]
Tart.....	Tartar	W.....	Weish
Te.....	Tellurium	W. or w....	West, -ern, -ward
technol...	technology	Wal.....	Walachian
teleg.....	telegraphy	Wall.....	Walloon
Tenn.....	Tennessee	Wash.....	Washington
term.....	termination	Westph....	Westphalia, -n
terr.....	territory	W. Ind.	West Indies, West
Teut.....	Teutonic	or W. I... }	Indian
Tex.....	Texas	Wis.....	Wisconsin
Th.....	Thorium	wt.....	weight
theat.....	theatrical	W. Va.....	West Virginia
theol.....	theology, theological	Wyo.....	Wyoming
therap.....	therapeutics	Y.....	Yttrium
Thess.....	Thessalonians	yd.....	yard
Ti.....	Titanium	yr.....	year
Tim.....	Timothy	Zech.....	Zechariah
Tit.....	Titus	Zeph.....	Zephaniah
Tl.....	Thallium	Zn.....	Zinc
toxicol....	toxicology	zool.....	zoology, zoological
tp.....	township	Zr.....	Zirconium
tr. or trans.	transitive		
transl.....	translation, trans- lated		

See also ABBREVIATIONS' in Vol. L

THE COLUMBIAN CYCLOPEDIA.

EPAMINONDAS, *ē-pam-i-nōn'das*: B.C. 414—B.C. 362; most eminent of Theban generals and statesmen, and one who elevated and for a long period held his country at a high point of honor and prosperity. He was descended from an ancient but impoverished family, and led a retired life till his 40th year, profiting by the instructions of Lysis the Pythagorean, who inspired him with enthusiasm for elevated ideas. E. became prominent first during the period when the Lacedemonians garrisoned the citadel of Thebes, and kept the inhabitants in subjection. Though he took no part in the desperate but successful stratagem by which his fellow-citizens recovered the *Cudmeia*, B.C. 379, he stepped forward immediately afterward into the ranks of the patriots; and when sent to Sparta B.C. 371 with several others, to negotiate a peace between the two countries, E. evinced firmness, dignity, and eloquence in the debate which ensued on the question whether Thebes should ratify the treaty in the name of all Bœotia, the result of which ratification would have been equivalent to a recognition of her claim to supremacy over the Bœotian towns. To this the Lacedemonians demurred, and the war was resumed; E. was appointed commander-in-chief; and, in conjunction with his friend Pelopidas, with an army of 6,000 men, defeated double that number of the enemy at Leuctra (B.C. 371). Two years later, he and Pelopidas marched into the Peloponnesus, incited several of the allied tribes to fall away from Sparta, and then turned his arms against that city, which, however, was bravely defended by Agesilaus. On his return to Thebes, E. was accused of having violated the laws of his country, by retaining the supreme power in his hands beyond the time appointed by law; but was acquitted in consequence of his open and animated defense. In the spring of B.C. 368 the war was renewed with increased fury between Thebes and Sparta, and E. once more marched into the Peloponnesus, but did not accomplish much; and on his return home was checked by Chabrias at Corinth. To atone for this unsuccessful undertaking, he advanced with 33,000 men into Ar-

EPANADIPLOSIS—EPAULEMENT.

cadia, and joined battle with the main body of the enemy near Mantinea, B.C. 362. E., at the head of his troops, succeeded in breaking the Spartan phalanx, but was mortally wounded in the breast by a javelin. Being told by the physicians that he would die as soon as the weapon was extracted, on receiving intelligence that the Boeotians had gained the victory, he is said to have torn out the javelin with his own hand, exclaiming: 'I have lived long enough.' His moral purity, justice, and clemency are extolled by the ancients as much as his military talents; and it is expressly recorded of him, that he never uttered a lie, even in jest. Compare Bauch, *Epaminondas und Thebens Kampf um die Hegemonie* (Breslau, 1834); Pomtow, *Das Leben des E.* (1870).

EPANADIPLOSIS, n. *ěp-ăn-a-dī-plō'sis* [Gr.—from *epanadiploō*, to make double, to repeat; *diploos*, double]: in *rhet.*, repetition; term applied to that figure in rhetoric when the sentence ends with the same words with which it begins.

EPANALEPSIS, n. *ěp-ăn-a-lěp'sis* [Gr. *epi* and *analēpsis*, taking up again; repetition; *analambanō*, I take up again, I repeat]: in *rhet.*, figure of speech by which the same word or clause is repeated after a parenthesis.

EPANAPHORA, n. *ěp-ăn-ăf'o-ra* [Gr. *epanapherō*, I bring back, I repeat]: in *rhet.*, figure in which a word or phrase is repeated at the beginning of successive clauses.

EPANARTHOSIS: same as **EPANORTHOSIS**.

EPANASTROPHE, n. *ěp-an-ăs'tro-fě* [Gr. *epanas-trophō*, I return]: in *rhet.*, figure in which the end of one clause is made the beginning of the next.

EPANODOS, n. *ěp-ăn'o-dōs* [Gr. *epi*, and *anodos*, a way up or back; *ana*, up; *hodos*, a way]: in *rhet.*, figure in which a sentence or member is inverted or repeated backward.—E. is also a return to the principal heads or to the proper subject of a discourse after a digression, or in order to consider the topics separately and more particularly.

EPANODY, n. *ěp-ăn'ō-dī* [Gr. *epanōdōs*, a rising, a return—from *epi*, upon; *anōdōs*, a way up, a return]: in *bot.*, an abnormal condition in which an irregular flower reverts to a regular form.

EPANORTHOSIS, n. *ěp-ăn awr-thō'sis* [Gr. *epanorthōō*, I set straight; I correct—from *epi*, up; *anorthōō*, I set straight up; *orthos*, straight]: in *rhet.*, figure of speech by which a person recalls what he has said, in order to substitute stronger or more significant words.

EPARCH, n. *ěp'ărk* [Gr. *eparchos*, the governor of a province—from *epi*, upon; *archē*, rule, supreme power]: the governor or prefect of a province in ancient Greece. **EPARCHY**, n. *ěp'ăr-kī*, a province or territory under a governor; a territory or district in Russia. The modern kingdom of Greece is divided into provinces called *Nomarchies*, and a Nomarchy is subdivided into *Eparchies*.

EPAULEMENT, n. *ě-pawl'měnt* [F. *épaulement*, a shoulder-piece—from *épaule*, the shoulder—from mid. L. *spatula*,

EPAULET—EPEIRA.

a shoulder]: in *siege-works*, a sidework to cover troops in flank, made of gabions, fascines, or bags of earth. The *siege-batteries* are generally shielded, at one end at least, by epaulements, forming an obtuse angle with the main line of the battery. The object is to protect the guns and gunners from a flanking fire. The name is often given erroneously to the parapet of the battery itself, but it applies properly to the flanking return only. Sometimes the whole of a small or secondary earthwork, including the battery and its flanks, is called an epaulement; and sometimes the same name is given to an isolated breast-work intended to shield the cavalry employed in defending a body of besiegers. EPAULE, the shoulder of a bastion, where one of the faces and one of the flanks meet.

EPAULET, or EPAULETTE, n. *ěp'aw-lět* [F. *épaulette*—from *épaule*, the shoulder—from mid. L. *spātūlā*, a shoulder, a small sword: It. *spalla*, the shoulder]: ornament sometimes worn on the shoulder by naval and military men. EP'AULET'TED, a. furnished with epaulets.—Ranks and degrees are marked in a very systematic way by means of crowns, anchors, and stars worked in silver on the epaulette; also by the size of the cords of the epaulette itself. In the British army, epaulettes were abolished during the Russian war, because of the danger to which officers thus conspicuously marked were exposed. It is retained by the French army alone of the armies of the great European powers.

EPAXIAL, a. *ěp-āks'ī-al* [Gr. *epi*, upon, over; Lat. *axis*; Gr. *axōn*]: in *anat.*, pertaining or relating to muscles lying above the embryonic vertebral axis. They are called by Huxley episkeletal muscles.

EPÉE, *ā-pā'*, CHARLES MICHEL, Abbé de L': 1712, Nov. 25—1789, Dec. 23; b. Versailles, France: one of the founders of the system of instruction for the deaf and dumb. He entered into holy orders, and became a preacher and canon at Troyes, but on account of his Jansenist opinions, was deprived of this appointment, and lived in retirement in Paris. In 1755, he began to occupy himself with the education of two deaf-mute sisters; and, as he asserts, without any previous knowledge of Pereira's efforts in the cause, invented a language of signs for persons thus afflicted. At his own expense, he founded an institution for deaf-mutes, and labored with unwearied zeal for it. His favorite wish, however, the foundation of such an institution at the public cost, was not fulfilled till after his death. He wrote *Institution des Sourds et Muets* (2 vols. Paris 1774), which afterward appeared in an improved form under the title, *La Véritable Manière d'Instruire les Sourds et Muets* (Paris 1784).

EPEIRA, *ē-pī'ra*: genus of spiders, type of a family called *Epeiridae*. They are of those spiders which have only a pair of pulmonary sacs and spiracles; construct webs with regular meshes, formed by concentric circles and straight radii, and are furnished with a pair of almost contiguous eyes on each side, other four eyes forming a quadrangle in the centre. Many of them are remarkable for beauty of colors and forms. Several species abound in gardens, par-

EPENCEPHALIC—EPERIES.

ticularly in autumn. *E. diadema* is one of the largest. It is found in moors, the borders of woods, etc.; but it is in tropical countries that the *Epeiridæ* are in greatest numbers, and attain the greatest size and beauty. The net, when loaded with wings, wing-covers, and limbs of insects that have been preyed upon, is often loosened, and falls down upon the central nest or den of the spider; and successive



Epeira Diadema.

nets thus falling down, form at last a ball sometimes as large as a man's head. Some of the spider cords, carried horizontally from tree to tree at a considerable height from the ground, 'are so strong as to cause a painful check across the face when moving quickly against them; and more than once,' Sir J. E. Tennent says, 'in riding I have had my hat lifted off my head by a single thread.'—Tennent's *Ceylon*.

EPENCEPHALIC, a. *ěp-ěn-sě-făl'ík* [mod. L. *epencephalon*]: in *anat.*, pertaining or relating to the epencephalon; the occipital or back part of the brain. **EPENCEPHALON**, n. *-sěf'al-ŏn* [Gr. *epi*, upon; *engkephalos*, the brain]: in *anat.*, portion of the brain which, with the metencephalon, constitutes the posterior primary vesicle. The epencephalon comprehends the cerebellum, the pons Varolii, with the anterior part of the fourth ventricle.

EPENCHYMA, n. *ěp-ěng'kì-mă* [Gr. *epi*, upon; *chumos*, juice]: in *bot.*, the fibro-vascular tissues.

EPENDYMA, n. *ěp-ěn'dĩ-mă* [Gr. *ependuma*, an outer or upper tunic—from *epi*, upon; *enduma*, clothing]: the delicate epitheliated structure which lines the canal of the spinal cord and the cerebral ventricles. **EPENDYMA-VENTRICULORUM**: same as **EPENDYMA**.

EPENTHESIS, n. *ě-pěn'thě-sīs* [Gr.—from *epi*, on or upon; *entithēmi*, I put or set in]: in *gram.*, the insertion of an additional letter or syllable in the middle of a word. **EP'ENTHET'IC**, a. *-thět'ík*, inserted in.

EPERGNE, n. *ě-pěrn'* [F. *épargne*, economy]: an ornamental stand with dish and branches for the centre of a table.

EPERIES, *ě-pā-rě-ěsh'* [Lat. *Fragopolis* or *Eperesinum*; Hung. *Eperjes*; Slovak, *Pressova*]: old town of Hungary,

EPERNAY—EPHELIS.

county of Saros, of which it is the capital; agreeably situated on the left bank of the Tarcza, about 150 m. n.e. of Pesth. It is surrounded with walls, is the seat of a bishop, and contains some houses of the 15th and 16th c., built in the style of those in Naples, with which E. was much connected in the middle ages. Its principal buildings are the Church of St. Nicholas, the communal college, with 500 students and a library of 14,000 vols., and the county hall. It has manufactures of earthen ware and of linens and woollens, and has some trade in linen goods, grain, and Tokay wine. In the vicinity are the Sovar saltworks, which produce 5,000 tons of salt annually. Pop. (1880) 10,139, mostly Slavs, with a few Germans.

EPERNAY, *ā-pěr-nā'*: town of France, dept. of Marne, headquarters of the *Vins de Champagne*; in the midst of a rich vine-growing district, on the left bank of the Marne, 19 m. w.n.w. of Chalons. It is well built, clean, and well paved. Its environs consist, for the most part, of elegant villas, with vaults attached, belonging to the Champagne wine merchants. E. manufactures large quantities of earthen-ware from a clay obtained in the neighborhood, and called *Terre de Champagne*; also hosiery, refined sugar, and leather. It has a brisk trade in bottles, corks, wire, champagne wines, etc. Pop. (1886) 17,709.

EPERUA, n. *ě-pěr'ŭ-d* [from *eperu*, Guianan name of the fruit of *Eperua falcata*]: genus of leguminous plants, suborder *Cesalpinieæ*, tribe *Amherstieæ*. *E. falcata*, the Wallaba tree of Guiana, has abruptly pinnate leaves, and peduncles of flowers. Sir R. Schomburgh says that the wood is deep red, frequently varied with whitish streaks, hard, heavy, shining, impregnated with an oily resin, and in consequence very durable.

EPEXEGESIS, n. *ě-pěks-ě-jě'sis* [Gr. *epexegeomai*, to narrate in detail; *ex*, out; *hēgeomai*, to lead]: a full or detailed account or explanation of something which has gone before; exegesis. **EPEXGETICAL**, a. *jět'ik-al* [Gr. *epi*, and *ex-egētical*]: of the nature of an epexegetis; explanatory of something which has gone before; exegetical.

EPHAH, or **EPHA**, n. *ě'fä* [Heb. *ephah*]: Hebrew dry measure of about 3 pecks 3 pints

EPHEBIDÆ, n. *ě-fě'bī-dē* [Gr. *ephēbos*, a kind of cup]: family of lichens, tribe *Hymenothalameæ*. Ephebe is the type.

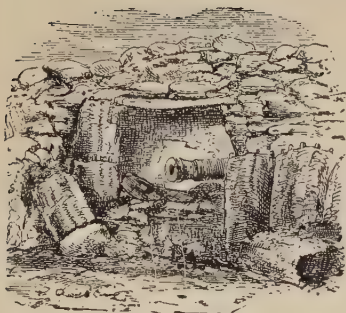
EPHEDRA, n. *ěf'ě-dra* [L. *ephedra*—from Gr. *ephedra*, a setting by or at a thing, a plant, perhaps *Equisetum sylvaticum*]: genus of *Gnetaceæ*. The flowers are diœcious. The species occur in all parts of the world. Their fruit is said to be mucilaginous, eatable, sub-acid, and slightly pungent. The branches and flowers of the Asiatic *ephedras* were formerly sold as styptics.

EPHELIS, n. *ě-fě'lis* [Gr. *epi*, upon; *hēlios*, the sun]: term for the freckles which appear in persons of fair complexion, on those parts of the skin exposed to the sun.

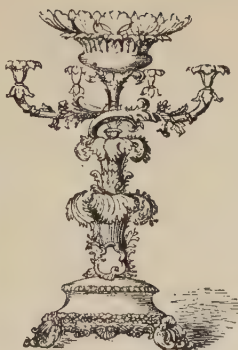
EPHEMERA.

EPHEMERA, n. ě-fēm'ĕ-ră [Gr. *ephēmērōs*, lasting but a day—from *epi*, on; *hēmēră*, a day]: that which lasts but a day; a fly that lives a day, or for a short period; in *med.*, a kind of fever (*febris diaria*) that lasts but a day or part of a day, usually arising from some local irritation. **EPHEMERAL**, a. -ăl, continuing or existing one day only; short lived. **EPHEMERÆ**, n. plu. ěf-ĕ-mēr'ĕ-ĕ [mod. L. *ephemerum*; L. adj. suff. -eæ]: tribe or family of inoperculate terminal foliated mosses. *Ephemerum* is the type. **EPHEMERID**, n. ě-fēm'ĕr-id, insect of the family *Ephemeridæ*. **EPHEMERIS**, n. -is, a daily account; an almanac containing the daily positions of the sun, moon, and planets, with useful information respecting the other heavenly bodies, and of such phenomena as depend upon them; a table of the positions of a heavenly body, as the *ephemeris* of the sun: such tables have become common since the days of Kepler. The first were published by Purbach for the years 1450-61. Those of Regiomontanus, for 1474, were much more accurate, and his *Ephemerides* met with universal acceptance. Similar publications were afterward made by Leovitius, Origanus, Kepler, and others. Among the most important of these numerous works at present are the French *Connaissance des Temps*, the English *Nautical Almanac*, the Berlin *Astronomisches Jahrbuch*, and the *American Ephemeris and Nautical Almanac*. **EPHEMERIDES**, n. plu. ěf'ĕ-mēr'ĭ-dĕz. **EPHEMERIST**, n. one who studies the daily motions of the planets by means of an ephemeris. **EPHEMERITES**, n. ě-fēm'ĕr-ĭts, in *paleon.*, presumed genus of *Ephemeridæ* of Carboniferous age. **EPHEMEROMORPH**, n. ě-fēm'ĕr-o-morf [Eng. *ephemeron*; Gr. *morphē*, form]: term coined by Bastian, to include the lowest forms of life under one general designation. **EPHEMERON WORM**, n. the ephemera which, however, continues long in the worm or larva state. It is when it reaches the perfect state that it is ephemeral in the duration of its life.

EPHEMERA [Gr. lasting for a day]: Linnæan genus of neuropterous insects, now forming the family or tribe *Ephemeridæ*. They are allied to the *Libellulidæ*, or Dragon-flies, but differ from them in many very important respects. They have received their name, to which corresponds the English **DAY-FLY**, sometimes also applied to them, from the brief duration of their existence in the perfect state, in which, very unlike the dragon-flies, they are believed to take no food, merely propagating their species, and dying. From the season of the year in which they begin to be seen, some of them are called also **MAY-FLY**; and by this name are well known to anglers, who use them, and artificially imitate them as excellent lures for trout. The eggs also of the ephemeræ are favorite food of fishes; they cohere together in a gelatinous mass. The larvæ and pupæ are aquatic, and in these states the ephemeræ have much longer life than in their perfect state, extending even to years. The larvæ and pupæ are voracious. The abdomen of the larva is furnished on each side with a set of leaflets, which serve instead of gills for respiration, and are used also in locomotion,



Epaulement.—From *Encyclopédie Militaire*.



Epergne.



EPHESIAN—EPHESIANS.

though there are six feet attached to the thoracic segments. The pupæ differ little from the larvæ except in having rudimentary wings inclosed under scales. Both larvæ and pupæ have the abdomen terminated by two or three jointed filaments, which the perfect insect also has, sometimes very long. The body of the perfect insect is soft and slender; the wings resemble in form those of dragon-flies, but are soft and filmy; in repose, they are elevated vertically above the body: the second pair of wings are much smaller than the first, and in some species are altogether lacking; the organs of the mouth are so soft and small as not easily to be discerned, and to be apparently unfit for any kind of use. Ephemeræ, in their larva and pupa states, live chiefly under stones in water, or in burrows which they make in the banks of streams. When ready for their final change, they creep out of the water to undergo it on some plant or other object by the water-side, generally toward sunset on some fine day of summer or autumn. After having attained their winged state, however, they cast off a complete slough or envelope, so perfect, that it exhibits even the limbs, abdominal filaments, and antennæ; and these 'ghost-like exuviae' are sometimes so abundant in the neighborhood of streams, as to cover in 'a pearly layer' the hat and basket of the angler. The multitudes of ephemeræ are often very great, filling the air as a cloud; nay, so abundant are they at times, that their bodies have been known to cover the ground in certain districts of France, and have been gathered from particular spots in cart-loads to be used as manure.

EPHESIAN, a. *ĕf-ĕ'zhî-ăn*: pertaining to *Ephesus*: N. a native of Ephesus, in Asia Minor.

EPHESIANS, EPISTLE TO THE: universally received as a genuine work of the apostle Paul. The only doubt in connection with it is whether it was addressed particularly to the church of Ephesus, or to some neighboring church or churches. Among the reasons for the doubt are: 1. Basil (became bp. of Cæsarea 370) says that the earlier writers whom he had consulted declared that in their copies of the epistle it was not addressed to any church by name; and that this was the fact also in the ancient manuscripts that he had seen. 2. In agreement with this testimony it has been discovered in recent times that the words 'in Ephesus' are not in the text of the Vatican and Sinaitic manuscripts, which are the oldest and best now known. 3. Marcion (wrote about 150) says that in his collection this epistle was addressed to the Laodiceans. But, as he was heretical in his opinions, and took strange liberties in matters relating to the Scriptures, his testimony is not to be trusted, unless confirmed by other witnesses. 4. In the epistle itself Paul says only that he had *heard* of the Christian faith of those whom he addressed; he seems also to imply that they may not have known of his mission as the apostle to the Gentiles; he sends no salutations to personal friends; and makes no allusion to his having ever lived among those to whom he wrote. These things are natural if the epistle was addressed to strangers, but hard to explain if it was

EPHESITE—EPHESUS.

written to a church founded by his own personal labors and perils, whose members he had counselled faithfully for three years, and whose elders had parted from him at Miletus with tears. In view of these reasons some suppose that the epistle was originally sent in succession to several churches, one of which was at Ephesus, and another, perhaps, at Laodicea. But its usefulness did not at first depend on its particular destination; nor is it now less useful because that destination is not certainly known. The very absence of local allusions and restrictions may make it better adapted to instruct the churches of all times and in every land. I. The *doctrinal* part of the epistle (which is informal in its method, and exultant in its terms) exhibits: 1. The glorious character of God, the Father of all, in his love, justice, mercy, and grace in Christ, by whom he provides redemption for men, Gentiles and Jews, according to the revelation of his eternal purpose bursting forth first on the darkness of this world, and to be fully manifested, at last and forever, among the principalities and powers of heaven. 2. The resurrection of Christ from the dead, followed by his exaltation to supreme power over all things for the welfare and perfection of his church. 3. The lost state of sinful men from which redemption delivers those that believe. 4. The full knowledge and personal experience of the blessings provided for Christians to be attained, in answer to prayer, through the working in them of that mighty power by which Christ had been raised from the dead and exalted in heaven. II. The *practical* part exhorts Christians to strive for the attainment of: 1. Unity of the spirit among themselves. 2. Holiness of heart and conduct. 3. Loving fidelity in the various relations of life. 4. Persevering activity in maintaining the conflict against spiritual adversaries, through strength to be derived from the Lord, and in the use of the whole armor which he supplies.

EPHESITE, n. *ĕf'ĕ-sĭt* [from *Ephesus*, in the vicinity of which it occurs]: pearly white mineral, hard enough to scratch glass.

EPHESUS, *ĕf'ĕ-sŭs*: one of the twelve ancient Ionic cities of Asia Minor, in Lydia, near the mouth of the river Caystrus, in the midst of an alluvial plain. It does not appear to have been as old as the Trojan war, but its primitive history has been confused by myths. It bore a great variety of names at different times, the principal of which, besides E., were Ortygia and Ptelea. According to Strabo, it was founded by Androclus, son of Codrus, and this is the most probable of the accounts which have come down to us, though others held to the tradition of its Amazonian origin. It was long before E. acquired any political importance, in spite of being a sacred city from an early period. Subdued first by the Lydian, and next by the Persian kings, it was included, after the death of Alexander the Great, in the territories of Lysimachus (B.C. 281), by whom it was greatly strengthened. Ultimately, it came into possession of the Romans; and in the time of

EPHESUS.

Augustus, when Strabo wrote, it was 'the greatest place of trade of all the cities of Asia w. of the Taurus.' This was its condition when visited by the apostle Paul, who resided here three years; but the destruction of its great temple by the Goths, A.D. 260, gave it a blow from which it never recovered. In 341, it was the scene of the *third* general council of the Christian Church. Its general history, while a city of the Byzantine empire, was unimportant, and before the days of Tamerlane it had almost completely perished.—The ruins of E. comprise a stadium 687 ft. long, fragments of a great theatre (alluded to in the account of the apostle Paul's preaching in the city), of an odeum or music-hall, and of various walls and towers, belonging to the Greek, Roman, and Byzantine eras. Near the w. extremity of the town are some massive structures, which have since 1868 been carefully excavated, at some spots, from beneath 18 ft. of soil. It is now certain that these stand on the site of the famous *Temple of Diana*. This marvellous building, one of the seven wonders of the world, was originally built by Chersiphron; but after its destruction by Herostratus on the night (as is said) when Alexander the Great was born (B.C. 356), it was rebuilt by the inhabitants in a style of greater splendor than before, the very women contributing their ornaments to secure the necessary funds; yet, notwithstanding this enthusiasm, more than 200 years elapsed before the new edifice was completely finished. It was the largest Greek temple ever constructed. Its length was 425 ft., its width 220, the number of its columns 128, of which 36 were carved, and their height 60 ft. It had an area more than four times that of the Parthenon at Athens, and even the Olympeium was only about two-thirds as great. But more wonderful than the temple itself were the numberless statues and pictures which it contained, executed by the best masters of Greece. The altar of the goddess was adorned principally with the works of Praxiteles. Certain cabalistic words, said to have been inscribed on the figure of Diana, were copied and carried about as charms. The vast temple, plundered of its treasures by Nero, and burned (as has been mentioned) by the Goths, was most likely finally destroyed by the iconoclasts, in the reign of Theodosius I., who issued his celebrated edict against the ceremonies of the pagan religion 381. The site of E. is now occupied by some wretched villages, the principal of which is Ayasaluk.—See the works of Guhl, Ernst Curtius, and Zimmermann, and Wood's account of his explorations in 1868–9.

EPHESUS, COUNCILS OF: two ecclesiastical assemblies. I. The third ecumenical council was summoned by Emperor Theodosius II. to meet about Pentecost, 431, to settle a complicated controversy, involving the following: 1. Differences of philosophical statement concerning the union of the divine and human natures in Christ; 2. Strife among bishops and churches, aggravated by their ambition and jealousy, and by assumed imperial authority over them;

EPHIPPIUM—EPHOD.

3. The homage increasingly rendered to Mary, the mother of Jesus, expressed in part by calling her 'the mother of God.' This controversy found its centre in Nestorius, bp. of Constantinople, who opposed the title 'mother of God,' but was willing to say 'mother of Christ.' At the time appointed many of the bishops were present, but some were detained by bad roads and other hindrances. After waiting two weeks the majority (consisting of 160 bishops), under the arbitrary lead of Cyril, bp. of Alexandria, having organized the council, condemned Nestorius and deprived him of his office. The detained bishops having arrived soon after, both sides appealed to the emperor, who permitted Nestorius to return to the monastery from which he had been called. II. The 'Robber Synod' (as history justly calls it), consisting of 135 bishops; convened by Theodosius (449) to consider again the controversy to which Nestorius gave name, and which, since his deposition, had become even more violent. In the proceedings of this council no opposition to the will of the president, Dioscuros, bp. of Alexandria, was allowed; the bishops were overawed by monks, soldiers, and brawny servants, and were compelled to sign *blank* papers, to be filled up as the leaders chose. These lawless methods, as well as the violent measures carried through by their aid, hastened a crisis in the Eastern Church, and greatly furthered the advancing power of the bp. of Rome, by compelling an appeal to him against oppression and wrong.

EPHIPPIUM, n. *ě-fíp'pĩ-ũm* [L.—from Gr. *ephippion*, anything placed on a horse's back, such as a horse-cloth, or a saddle; *epĩ*, upon; *hippos*, a horse]: in *zool.*, a receptacle on the back of the entomostrocan called *Daphnia*, in which the winter eggs are deposited.

EPHOD, n. *ě'ød* [Heb.]: vestment worn by the Jewish high-priest over the *Měil* or second (purple) tunic. It consisted of two shoulder-pieces, one covering the back, the other the breast and upper part of the body, not unlike the Greek *epōnĩa*. Two onyx stones set in gold fastened it on the shoulders, and on each of the stones were engraved the names of six tribes, according to their order. The material of which the E. was wrought was extremely costly and magnificent: 'gold, blue, purple, crimson, and fine twined linen.' A girdle or band, of one piece with the E., fastened it round the body. Just above this girdle, in the middle of the E., and joined to it by little gold chains, rings, and strings, rested the square oracular breast-plate with the mysterious *Urim and Thummim*. See **HIGH-PRIEST: URIM AND THUMMIM**.

Originally intended to be worn by the high-priest exclusively: ephods of inferior material seem to have been in common use in later times by the ordinary priests. Even David, when bringing the ark back to Jerusalem, appeared in one. There is mention made of an ephod also in several passages of the books of Judges and Samuel, where the word must needs stand either for the *whole* priestly apparatus of an illegal service, or simply for a

EPHOR—EPHRAEM SYRUS.

statue or an idol: the Talmud understands this E. to have been a colossal shoulder vestment of gold, to which divine honors were rendered.

EPHOR, n. *ěf'ōr*, EPHORI, n. plu. *ěf'ōr-ī* [Gr. *ephorāō*, I look at or over]: order of magistrates in ancient times which appears to have originated at Sparta, and to have been peculiar to the Doric governments. When or by whom the ephori were first instituted is uncertain. Herodotus attributes their creation to Lycurgus, and Aristotle to Theopompus (B.C. 770-720). Their duty was to superintend the internal administration of the state, especially affairs of justice, for which a particular building was assigned them, called the Ephorion. One of their most important functions was the oversight, at least in part, of the education of youth, for we are told by Athenæus that they inspected the clothing and bedding of the young men. The ephori were five in number; they were elected by and from the people—on which Aristotle observes, that through them the *demos* enjoyed a participation in the highest magistracy of the state; and held their office for only one year. Their influence gradually increased, for their powers were so ill defined that it was difficult to say what was *not* under their cognizance and authority. Cicero draws a comparison between the ephoralty of Sparta and the tribunate of Rome, which is not unwarranted by the facts of the case. Ultimately, the kings themselves became subject to the supervision of the ephori. Cleomenes, for example, was brought before them for bribery; Agesilaus was fined, and Pausanias imprisoned; and in extreme cases they could prefer charges against the kings, and have them tried before the supreme criminal court. They also transacted negotiations with foreign powers, subscribed treaties, raised troops, 'intrusted the army to the king or some other general,' and, in fact, acted as the executive of the state. Muller regards the ephoralty as 'the principle of change in the Spartan constitution, and, in the end, the cause of its dissolution.' In the hands of the ephori, the constitution of Sparta certainly ceased to be a genuine aristocracy, and became a sort of oligarchy; but the subject is involved in obscurity and perplexity. Their authority was at last destroyed by Agis and Cleomenes, who murdered the ephori then ruling, and restored the old Spartan constitution, B.C. 225.

EPHRAEM SYRUS, *ěfra-ēm sir'ūs*: one of the most celebrated and prolific ecclesiastical writers of the Syrian Church: died, Edessa, 378. Several accounts of his life have been handed down to us, but all are more or less legendary. It appears, then, that Ephraem (Heb. *Ephraim*) was born in the early part of the reign of Constantine the Great, 'somewhere between the Euphrates and Tigris,' probably at Nisibis. His parents were, according to some, heathens; and E., repudiating their idolatry at an early age, had to leave their roof. Jacob, Bp. of Nisibis, took care of the boy, and undertook his education. His progress in learning was so satisfactory that the bishop

EPHRAEM SYRUS.

was soon able to make him teacher at his own school; and when in 325 Jacob went to the council of Nicæa, E. accompanied him thither. In 363, Nisibis was ceded by Jovinian to the Persians, and E. first retired into Roman territory, then went to Anid, his mother's birth-place, and finally settled in Edessa (Orfa), where he remained until his death. He is said to have been so poor when he first arrived at Edessa, that he was obliged to take service at a public bath, but he soon became acquainted with hermits of the neighborhood, and adopted their habits: he retired into a cave near the town, and led the life of a recluse. But so great were his piety and asceticism, as well as his readiness to help the poor and tend the sick, that he was looked upon as a saint, and his day is still celebrated, at different dates, in various churches. Among his usual denominations, referring especially to his teachings and writings, are 'Prophet of the Syrians, Column of the Church, Harp of the Holy Spirit,' etc.; and his name is never mentioned without the 'Mor' or 'Mari' (Lord, My Master) being prefixed. But for all that, he had no lack of enemies. His burning zeal for preaching and converting led him to attack most fiercely almost every one beyond the pale of his peculiar creed. He spoke and wrote unceasingly against Idolaters, 'Chaldees,' Jews, and heretics of all kinds, especially Arians, Sabellians, Manichæans, Novatians, etc. Toward the end of his life, he paid a visit to Basil the Great, in Cappadocian Cæsarea, who could not prevail upon him to accept of any higher office in the church than a deanery, though he spared no effort to make him bishop. Returned to Edessa, he found plague and famine raging there, and to his over-exertions for the relief of the sufferers his death is attributed by some. He expired in the same year with Basil, having given the strictest injunctions that his burial should be of the very simplest description. The Testament which he is reported to have dictated in his dying hour—much as it has been used for biographical purposes—is entirely spurious.

The visit to Basilius, unimportant as it seems, has been of very great moment. The legend which surrounds this, as all other incidents of his life, with a halo of miracle, records that the two men, though previously ignorant of each other's language, began to speak them fluently at this interview—Basilius Syriac, and E. Greek. This wonderful story first induced the learned to enter upon the question, whether E., half of whose voluminous works are in Greek, did really understand that language; and further, whether he understood any language but his own, Syriac. If he did not, what view was to be taken of his Commentaries on the Bible, of which the Hebrew and Greek texts, as well as the Septuagint and the Greek Fathers, must have been a sealed book to him. There were, and are still, great differences of opinion on these points, but it is generally supposed now, that he did not understand any language but his own; that he made use of the common Syriac version, the Peshito; that his grammatical and linguistic notes are taken from different Syriac Commentaries, and that the Greek portion

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of his works consists partly of translations made from his Syriac after his death, or even during his lifetime, and partly of interpolations. Both the praise and the blame which have been indiscriminately bestowed upon him as a writer are exaggerated. His chief merit lies in the glowing fervor and the deep piety which he infused into all he wrote, particularly into his elegiac hymns. Diction and form are poetical throughout, and when not soaring into the infinite, of real beauty. The effect is heightened by the matchless simplicity and awing grandeur of the Syriac idiom.

Of his principal works and their editions, those (under his name) in Greek, consist of Sermons or Homilies, and Treatises of an exegetic, dogmatic, and ascetic nature. Photius records that he wrote more than a thousand such sermons; Sozomenos speaks of '300 myriads;' but, of those that have come down to us, some are spurious, and others at least dubious. Gerhard Vossius translated 171 treatises from Greek mss. found in Italian libraries, into Latin, and published them at Rome, 1589-98, in 3 vols. (There is but one piece in them translated from the Syriac.) They were reprinted in Cologne 1603, 1619, 1675; also in Antwerp 1619. The first Greek edition appeared in Oxford 1709, edited from 28 Oxford mss. by E. Thwaites. The most important of his Syriac works are, besides an immense variety of homilies, sermons, poems, etc., his commentaries, or rather scholia, on parts of the Old Testament. Their value to us, however, is limited to their aiding us in explaining and fixing some readings of the Peshito (see ПЕШИТО), and in enriching our critical apparatus. That he also commented on the Gospels is certain, but no ms. has been found as yet, not even in a Greek or Arabic translation. As to the songs and prayers in the Syrian Liturgy ascribed to E., the fact is that they are merely composed in his manner, and betray their comparatively recent origin at the first glance. The principal edition of his works in Syriac and Greek was published in 6 vols., Rome, under the papal authority (1732-46).

The principal writers on E. are: Sozomenos, *Hist. Eccl.* iii. 16; Assemani, *Proleg. and Biblioth. Orient.*; Credner (1827); Lengerke, *Comm. de Ephr. Syr.* (1828), and *De Ephr. Syr. Arte Hermen.* (1831); Morris (*Select Works of E.*, 1847); Burgess (*Select Metrical Hymns of E.*, 1853); Rödiger (in Herzog's *Realencyklopädie*); Overbeck (Syriac text, 1865); Bickell (with Latin translation, 1866).

EPHRAIM, *ēfra-īm*: younger son of the Hebrew patriarch Joseph by his wife Asenath, and the founder of one of the 12 tribes of Israel. It is possible that he may have received his name, which signifies 'double fruitfulness,' from having been born during the seven years of plenty. His grandfather, Jacob, shortly before his death, prophesied the greatness of his posterity when giving him his blessing: 'His seed shall become a multitude of nations' (Gen. xlviii 19). After the Israelites had left Egypt, the tribe of E. numbered 40,500. (Numbers, i. 32, 33); but from

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causes not specified, and not discoverable, it had sunk 40 years later, on the eve of the conquest of Canaan, to 32,500 (Numbers, xxvi. 37). Yet it was under the leadership of an Ephraimite, Joshua, the son of Nun, that the Canaanites were subjugated, and the land possessed. This seems to have given the tribe a much higher influence than might have been expected from its numerical strength. We find Judah and E. classed together as taking their inheritance first (Josh. xv. xvi., etc.).—The precise boundaries of E., as of the other tribes, it is impossible to determine. It occupied the centre of Palestine, was bounded on the s. by Dan and Benjamin, and stretched from the Jordan on the e. to the Mediterranean on the west. From scattered notices of the Ephraimites in the earlier annals of the Hebrews, we infer that they were, on the whole, jealous of their brethern. This feeling of dissatisfaction at length broke out into rebellion in the reign of Rehoboam, and the new kingdom of Israel, ruled over by Jeroboam, was for the most part merely the kingdom of E., for the land which lay n. of it could hardly be said to be actually in the possession of the tribes whose names it bore, the original inhabitants keeping stubborn hold of their cities and strongholds. See JEWS.

EPHYRA, n. *ěf'i-ra* [L. *Ephyra*; Gr. *Ephura*, old name of Corinth]: pseudo-genus of *Rhizostomidæ*, being the 'hydratuba' or larva state of *Aurelia* or other true genera of the family; genus of geometer moths.

EPI, prefix, *ěp'i* [Gr.]: on; upon; during; on the outside or above: *epi* has the forms *ep* and *eph*; *ep* is used before a vowel, *eph* with an aspirate, and *epi* before a consonant.

EPI, *ěp'i*, or GIROU'TTE, *ĵir-ô-ět'* [Fr.]: species of ornamental ironwork with which the cones of pavilions or pointed roofs are sometimes surmounted in the renaissance style of architecture. One of the finest examples surmounts the Tourelle aux Pastorals at the Hôtel de Bourghtheroulde in Rouen, France.

EPIBLAST, n. *ěp'i-blăst* [Gr. *epi*, upon; *blastos*, a shoot]: an abortive organ in the oat, supposed to be the rudiment of a second cotyledon.

EPIBLEMA, n. *ěp'i-blě'mă* [Gr. *epiblēma*, an upper garment, a patch—from *epiballō*, I put on—from *epi*, upon; *ballō*, I throw, I cast]: an imperfectly formed epidermis covering the newly formed extremities of roots, etc., being, as it were, the tissue which first covers wounds.

EPIC, a *ěp-ik* [L. *epicūs*; Gr. *epikōs*, epic—from Gr. *ēpos*, a song: It. *épico*: F. *épique*]: narrative; heroic. EPIC POEM, a poem that contains a narrative or story.—The two chief kinds of poetry, are Epic poetry and Lyric poetry. Epic poetry has outward objects for its subject, of which it gives an imaginative narrative. The events themselves may be partly real and partly fictitious, or they may be altogether fictitious. Lyric poetry, on the other hand, sets forth the inward occurrences of the writer or speaker's own

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mind—his feelings and reflections. No composition, perhaps, answers, in all its parts, to the one of these descriptions, or to the other; but a piece or poem is classed as epic or lyric according to the element that predominates. Under each of these grand divisions, or genera, there are subdivisions, or species. The longer poems of the epic genus embrace an extensive series of events, and the actions of numerous personages. The term *heroic epic*, or *heroic poem*, is properly applied to such works as the *Iliad* and *Odyssey* of Homer, Virgil's *Æneid*, Tasso's *Jerusalem Delivered*, Ariosto's *Orlando Furioso*, and others, which describe the achievements of the gods and heroes of antiquity, or of the almost equally mythic knights of mediæval chivalry. Poems like Milton's *Paradise Lost* and Dante's *Divina Commedia*, are *sacred epics*. Byron's *Childe Harold*, with the length and narrative structure of an epic, abounds in reflection, sentiment, and satire, and thus is, in substance, as much lyric as epic. Productions like those now named form the class of grand epics, or epic poems, by way of eminence. But there are also several species of minor poems which, from their nature, must be ranked as epics. One of these is the *Idyl*, a term applied to what is called *pastoral poetry*, or to descriptions in general of natural scenery, and of the actions and manners of men in calm, ordinary life. Burns's *Cotter's Saturday Night*, Goldsmith's *Deserted Village*, and most of Crabbe's poems, are idyls; so are poetical epistles. The *ballad* (q.v.) is another species of minor epic.

Attempts at epic poetry are now rare, the spirit of the age being against that form of composition. Instead of epic poems, we have *novels*, which, so far as subject is concerned, may be considered as the epics of modern civil and domestic life.

EPICALYX, n. *ěp'ĩ-kā'łĩks* [Gr. *epĩ*, upon; Eng. *calyx*]: the outer calyx, consisting either of sepals or bracts, as in mallows, or probably of stipules of the sepaline leaves.

EPICARP, n. *ěp'ĩ-kārp* [Gr. *epĩ*, upon; *karpōs*, fruit]: the outer skin of fruits—the fleshy or edible portion being called the *sarcocarp*, and the stone the *endocarp*.

EPICENE, a. *ěp'ĩ-sēn* [L. *epicœnus*, of both sexes—from Gr. *koinos*, common]: in *gram.*, common to both sexes. EPICENE NOUNS, names of animals which take their gender from their termination without regard to sex.

EPICCHARMUS, *ěp-ĩ-kār'mūs*: Greek poet; b. in the island of Cos, B.C. 5th c. At first, he studied philosophy under Pythagoras; but a residence at Megara, the native soil of comedy, gave him a taste for that branch of the drama. After the destruction of Megara, B.C. 484, he removed to Syracuse, where, at the court of Hiero, he spent the remainder of his life. From this circumstance, he is often mentioned by the ancients as a Sicilian. Almost nothing else is known of his personal history except that he died at the age of 90, or, as some say, 97: the date is unknown. E. is called by Theocritus the father of comedy, and Plato assigns him a place among comic writers as high

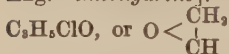
EPICHILIUM—EPICOROLLINE.

as that of Homer among epic poets. He certainly did good service in excluding, to a large extent, from his dramas the vulgar buffoonery which disgraced all previous comedies, and in introducing a regular plot in which the *comus* or band of revellers sustained the dialogue. None of E.'s works survive entire; but we possess several fragments and the titles of 35. They embraced a wide variety of topics, mythological, social, and political. From one of them, Plautus borrowed the plot of his *Menæchmi*, which shows great constructive skill. The fragments of E. have been collected and edited by H. P. Krusemann (Haarlem 1834). Compare Lorenz, *Leben u. Schriften des E.* (1864), and Guigniant, *Histoire de la Comédie Antique* (1863).

EPICHILIUM, n. *ěp'î-kîl'î-ûm* [Gr. *epi*, upon; *cheilos*, a lip]: in *bot.*, the upper portion of the lip of any orchidaceous plant when this organ is divided into two parts which are dissimilar in appearance.

EPICHIREMA, n. *ěp'î-kî-rě'ma* [Gr. *epicheireō*, I attempt; I put my hand to; *epi*, upon; *cheir*, the hand]: in *rhet.* and *logic*, syllogism in which the proof of the major or minor premise, or both, is introduced with the premises themselves, and the conclusion is drawn in the usual way.

EPICHLORHYDRIN, n. *ěp'î-klôr-hî-drîn* [Gr. *epi*, upon; Eng. *chlorhydrins*]: in *chem.*, glycidic hydrochloride,



CH_2Cl . It is isomeric with mono-chloroacetone, $\text{CH}_2\text{Cl}\cdot\text{O}\cdot\text{CH}_3$. Epichlorhydrin is obtained by adding finely powdered caustic soda slowly to dichlorhydrin, but the temperature must not rise above 130° . Then it is distilled. E. is a colorless liquid insoluble in water; it boils at 117° ; soluble in alcohol and in ether. It unites with fuming hydrochloric acid, forming symmetrical dichlorhydrin, $\text{CH}_2\text{Cl}\cdot\text{CH}(\text{OH})\cdot\text{CH}_2\text{Cl}$. By long boiling with water it is converted into monochlorhydrin. Nitric acid converts it into chlor-lactic acid, $\text{CH}_2\text{Cl}\cdot\text{CH}(\text{OH})\cdot\text{CO}\cdot\text{OH}$.

EPICHLORITE, n. *ěp'î-klôr'it* [Gr. *epi*, upon, over, with; Eng. *chlorite*: named to suggest that it is allied to chlorite]: dull green mineral with a white or greenish streak, and greasy lustre. It occurs fibrous or columnar. Found at Harzburg.

EPICLINE, n. *ěp'î-klîn* [Gr. *epi*, upon; *klînē*, a bed]: in *bot.*, the nectary when placed on the receptacle of the flower. **EPICLINAL**, a. *ěp'î-klî'nāl*, seated on the disk or receptacle.

EPICOLIC, a. *ěp'î-kôl'ik* [Gr. *epi*, upon; *kôlon*, the colon]: in *anat.*, the colon; pertaining to the part of the abdomen so situated.

EPICOROLLINE, n. *ěp'î-kôr'ôl-lîn* [Gr. *epi*, upon; Eng. *corolline*]: in *bot.*, inserted upon the corolla.

EPICRANIUM—EPICTETUS.

EPICRANIUM, n. *ěp'ĩ-křā'nĩ-ŭm* [Gr. *epĩ*, upon; *křānion*, the skull]: the scalp or integuments lying over the cranium. **EPICRANIAL**, a. *ěp'ĩ-křā'nĩ-āl*, applied to the muscle which extends over the upper surface of the cranium uniformly from side to side, without division.

EPICTETIAN, a. *ě-pĩk-tě'shĩ-an*: of or relating to Epictetus.

EPICTETUS, *ěp-ĩk-tě'tũs*: celebrated philosopher, disciple of the Stoa; b. Hierapolis, in Phrygia, about A.D. 50. He was at first the slave of Epaphroditus, a freedman of Nero, at Rome, whose abusive treatment he is said to have endured with the composure characteristic of the sect to which he belonged. He was afterward manumitted, and applied himself to the Stoic philosophy. Domitian hated him on account of his principles, and banished him along with several other philosophers, from Rome. E. settled at Nikopolis, in Epirus. Under the pressure of the times in which he lived, his serious moral views received a character rather of self-denial than of energy; to renounce, to endure, and not to set the mind upon anything beyond the power of the individual to attain, being the points chiefly insisted on. His pupil, Arrianus, collected the maxims of E. in the work entitled *Encheiridion* ('Handbook') and in eight books of Commentaries, four of which are lost. The peculiar excellence of the writings of E. consists in their simple and noble earnestness. That real heartfelt love of good and hatred of evil which we associate with Christian feeling, manifests itself very finely and beautifully in these; though, as Prof. Brandis says, 'there is not a trace in the *Epictetea* to show that he was acquainted with Christianity, and still less that he had adopted Christianity, either in part or entirely.' Some of his opinions, moreover, are essentially Christian in their nature, though, of course, they are unconnected with the facts of revelation. E. believes in our 'resemblance' to God, in our 'relationship' to him, and in our 'union' with him through the coincidence of the 'will' and the 'soul;' he recognizes the contest between good and evil, the life-struggle in the heart, the divine life against which the law in the members wars; and he affirms the necessity of 'invoking God's assistance in the strife,' that the inner life may become pure as God is pure. There are several good editions of the works of E.; the most complete is that of Schweighauser (Leip. 1800).

EPICTETUS, n. *ěp'ĩ-kũr* [L. *Epĩcũrũs*; Gr. *Epĩkourũs*, Epicurus, a famous Greek philosopher, to whom is ascribed, but erroneously, the teaching that 'pleasure is the highest good']: a man who indulges in the luxuries of the table; a dainty eater. **EPICTETUS'AN**, a. *-kũ-rě-ān*, luxurious: N. a disciple of Epicurus. **EPICTETUS'ISM**, n. *-rĩzm*, luxury; habits of gross indulgence. **EPICTETUS'ANISM**, n. *-rě-ān-ĩzm*, or *-kũ-rě-ān-ĩzm*, the doctrines of Epicurus. **EPICTETUS'IZE**, v. *-rĩz*, to become an epicure; to play the epicure. **EPICTETUS'IZING**, imp.: **ADJ.** tending toward the doctrines of Epicurus.—**SYN.** of 'epicure': gourmand; voluptuary; sensualist.

EPICURUS.

EPICURUS, *ĕp-ĭ-kū'rŭs*—**EPICUREANISM**, *ĕp-ĭ-kū'rĕ-an-ĭzm*, or *-rĕ'an-ĭzm*: an illustrious Greek philosopher, and his system. **EPICURUS**: B.C. 341—B.C. 270; b. in the island of Samos, seven years after the death of Plato. His father, Neocles, is said to have been a schoolmaster, and his mother, Chærestrate, to have practiced arts of magic. At the age of 18, he went to Athens, where it has been supposed that he may have had for his teacher Xenocrates or Theophrastus, or perhaps both, but he himself used to declare that he was self-taught. Of the older philosophers, he was most attached to Anaxagoras and Democritus, his system of physics being evidently built upon the atomic speculations of the latter. E.'s stay at Athens on this occasion was short. At Mitylene, in his 32d year, he first opened a school; and there and at Lampsacus he taught for five years. In B.C. 306, he returned to Athens, and established a school of philosophy in a garden which he purchased and laid out for the purpose. From this circumstance, his followers were called the 'philosophers of the garden.' Although E. laid down the doctrine, that *pleasure* is the chief good, the life that he and his friends led was one of the greatest temperance and simplicity. They were content, we are told, with a small cup of light wine, and all the rest of their drink was water; and an inscription over the gate promised to those who might wish to enter no better fare than barley-cakes and water. The chastity of E. was so incontestable, that Chrysippus, one of his principal opponents, in order to deprive him of all merit on the score of it, ascribed it to his being without passions. The calumnies which the Stoics circulated concerning him are undeserving of notice, and were at no time generally believed. E.'s success as a teacher was signal; great numbers flocked to his school from all parts of Greece, and from Asia Minor, most of whom became warmly attached to their master, as well as to his doctrines, for E. seems to have been characterized not less by amiability and benevolence than by force of intellect. He died in the seventy-second year of his age.

E. was a most voluminous writer. According to Diogenes Laertius, he left 300 volumes. Among others, were 37 books on Natural Philosophy, a treatise on Atoms and the Vacuum; one on Love; one on Choice and Avoidance; another on the Chief Good; four essays on Lives; one on Sight; one on Touch; another on Images; another on Justice and the other Virtues, etc. Almost all these works are lost: the only writings of E. that have come down to us are three letters, and a number of detached sentences or sayings, preserved by Diogenes Laertius, in his life of the philosopher. The principal sources of our knowledge of the doctrines of E., besides the above letters, etc., are Cicero, Seneca, and, above all, Lucretius, whose great poem, *De Rerum Natura*, contains substantially the Epicurean philosophy.

Although the majority of E.'s writings referred to *natural* philosophy, yet he was not a *physicist*, properly speaking. He studied nature with a *moral* rather than with a

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scientific design. According to him, the great evil that afflicted men—the incubus on human happiness—was FEAR; fear of the gods and fear of death. To get rid of these two fears, was the ultimate aim of all his speculations on nature.

The following is a brief account of his views. E. regarded the universe (*Tò Pān*) as corporeal, and as infinite in extent, and eternal in duration. He recognized two kinds of existence—that of bodies, and that of *vacuum*, or space, or the intangible nature. Of his bodies, some are compounds, and some atoms or indivisible elements, out of which the compounds are formed. The world, as we now see it, is produced by the collision and whirling together of these atoms. He also held the doctrine of perception by *images* (Gr. *eidōla*) which are incessantly streaming off from the surface of all bodies, and which are necessary to bring us into *rapport* with the world without. In like manner, he believed that sounding bodies threw off emanations, by which we are brought into sympathy with them; and that perception by smell took place in the same way. In psychology, E. was a decided materialist, holding, for various reasons, that the soul is a bodily substance, composed of subtile particles, disseminated through the whole frame, and having a great resemblance to spirit or breath with a mixture of heat.

In seeking to understand the phenomena of the heavens, E. has no scientific end in view; his sole object is to enable the mind to account for them to itself, without the necessity of imagining any supernatural agency at work. 'The phenomena of the heavens,' says E., 'admit of various causes being assigned for their production, equally conformable to the facts learned from the senses. If, then, in thinking of any appearance, we suppose it brought about by the same cause that produces another appearance which gives no alarm or uneasiness, we are as much delivered from uneasiness as if we *saw* that such is the cause of it.' E. did not deny that there are gods, but he strenuously maintained, that as 'happy and imperishable beings,' they could have nothing to do with the affairs of the universe or of men. 'Beware,' he says, 'of attributing the revolutions of the heaven and eclipses, and the rising and setting of stars, either to the original contrivance or continued regulation of such a being. For business, and cares, and anger, and benevolence, are not accordant with happiness, but arise from weakness, and fear, and dependence on others.'

E. next proceeds to deal with the fear of death. Having proved in his psychology that the dissolution of the body involves that of the soul, he argues that the most terrible of all evils, death, is nothing to us, 'since *when we are, death is not; and when death is, we are not*. It is nothing, then, to the dead or the living; for to the one class it is not near, and the other class are no longer in existence.' Whether E. actually succeeded in removing the terrors of death by his syllogism, may be doubted.

As to the *positive* part of E.'s system, he held that *pleasure*

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was the chief good, and it is from a misapprehension of the meaning of this word as used by E. that the term Epicurean came to signify one who indulged his sensual appetites without stint or measure. At the same time, it is easy to see that the use of the word 'pleasure' was likely to produce the mischievous results with which the later Epicureanism was charged. According to E. the sources and tests of all ethical truth are the feelings (*pathe*), and these are two, pleasure and pain. We delight in the one, and avoid the other instinctively. 'When we say that pleasure is the end of life, we do not mean the pleasures of the debauchee or the sensualist, as some from ignorance or from malignity represent, but freedom of the body from pain, and of the soul from anxiety. For it is not continuous drinkings and revellings, nor the society of women, nor rare viands, and other luxuries of the table, that constitute a pleasant life, but sober contemplation that searches out the grounds of choice and avoidance, and banishes those chimeras that harass the mind.' But, on the other hand, E. says: 'If the means to which sensualists owe their pleasures dispelled the anxieties of the mind . . . and enabled them to set limits to their desires, we should have no grounds to blame them for taking their fill of pleasure, wherever they could find it, provided it were attended with no pain or grief from any quarter; for that is the only evil.' The whole question of ethics, then, comes to a calculation and balancing of pleasures and pains; in other words, the cardinal virtue is a selfish *prudence*. E. rests *justice* on the same prudential basis as temperance. Denying any abstract and eternal right and wrong, he affirms that injustice is an evil, because it exposes the individual to disquietude from other men; justice is a virtue, because it secures him from this disquietude. 'Injustice is not an evil in itself, but becomes so from the fear that haunts the injurer of not being able to escape the appointed avengers of such acts.' The duties of friendship and good-fellowship are inculcated on the same grounds of security to the individual.

Among the Romans, the system of E. was adopted by many distinguished men. Horace, Atticus, and Pliny the Younger, were Epicureans; and the splendid poem of Lucretius must have recommended the system to many. In modern times, Epicureanism was resuscitated in France by Pierre Gassendi, who published an account of E.'s life and a defense of his character 1647. Many eminent Frenchmen have professed his principles; among others, Molière, Saint Evremond, Count de Grammont, the Duke of Rochefoucauld, Rousseau, Fontenelle, and Voltaire; and his system has doubtless never lacked practical development in all lands.

EPICYCLE, n. *ěp'ě-sě'kl* [Gr. *epi*, upon; *kuklos*, a circle]: a little circle whose centre is on the circumference of a greater circle. The earlier astronomers assumed that all the motions of heavenly bodies took place in circles, the circle being held to be the most *perfect* of all curves; and a necessary consequence of this assumption was, that the mo-

EPIDAMNUS.

tions must have a uniform velocity. Another part of the hypothesis was, that all the heavenly bodies moved round the earth, which remained at rest in the centre. The observed phenomena of the heavens, however, were soon seen to stand in glaring inconsistency with these assumptions; and to remedy this, it was necessary to have recourse to additional assumptions. For the sun and moon, which manifestly do not always move with the same velocity, the *Eccentric Circle* was imagined. The case of the planets, whose motions were seen to be sometimes direct, sometimes retrograde, and sometimes altogether arrested, offered still greater difficulties; to surmount which, the idea of *epicycles* was hit upon. According to this hypothesis, while a planet was moving in a small circle, the centre of that small circle was describing a larger circle about the earth. This larger circle was called the *deferent*, and the smaller, which was borne upon it, was called the *epicycle*. In this way the motions of the planets about the earth were conceived to be something like what the motion of the moon about the sun actually is. By assuming proper proportions between the radii of the deferent circle and the epicycle, and between the velocities of the two motions, it was found possible to account approximately for the above-mentioned appearances and irregularities in the motions of the planets. But it is only the irregularities arising from the revolution of the earth about the sun that can be at all explained in this way, and not those arising from the elliptic motions of the planets about the sun, nor the inequalities of the moon's motions. The successors of the Greek astronomers, down to Tycho Brahé, continued, therefore, to increase the number of epicycles, setting one circle upon another, until the hypothesis, in itself complicated, became still more so, filling the heavens with a mazy dance of stars, in striking contrast to the simplicity of the Copernican system. EPICYCLOID, n. *-kloyd* [Gr. *eidōs*, form]: peculiar curve described by a point in the circumference of one circle when moving over the convex or concave part of the circumference of another. When a circle moves upon a straight line, any point in its circumference describes a cycloid (q.v.); but if the circle move on the convex circumference of another circle (i.e. if the circle be an epicycle), every point in the plane of the first circle describes an epicycloid; and if on the concave circumference, a hypocycloid. The circle that moves is the generating circle; the other, the base. The describing point is not necessarily in the circumference of the generating circle, but may be anywhere in a radius or its prolongation. This curve was investigated first by the Danish astronomer Römer. It has many remarkable properties, and is even useful in the practical arts. The teeth of wheels in machinery must have an epicycloidal form, in order to secure uniformity of movement. EPICYCLOIDAL, a. pertaining to. EPICYCLOIDAL WHEEL, a wheel for converting circular into alternate motion, or the reverse.

EPIDAMNUS: see DURAZZO.

EPIDAUROS—EPIDEMIC.

EPIDAUROS, *ēp-i-daw'rūs*: town of ancient Greece, on the e. shore of the Peloponnesus, in the district of Argolis, on a small promontory, 15 stadia in circumference, in the Saronic Gulf; lat. 37° 38' n., long. 23° 10' e. During the most prosperous period of Grecian history, E. was an independent state. It was colonized first, it is supposed, by Carians (hence the older name of *Epicarus*, according to Aristotle), and afterward by Ionians, but was subsequently invaded by a Dorian army under Deiphontes, son-in-law of Temenus the Heracleide. This force dethroned Pityreus, the Ionian king of E., compelled him and his citizens to retire to Athens, and inaugurated the Dorian rule, which preserved the ascendancy at E. during the whole historical period. The form of government was originally monarchical, but after many vicissitudes, it eventually became and remained oligarchical. At an early period, E. became one of the chief commercial cities of the Peloponnesus. It colonized the islands of Cos, Calyndus, and Nisyros, as well as the town of Ægina, which, during the 6th c., attracted all the commerce from the then declining mother-city. E. was famous chiefly for its temple of Æsculapius, to which patients resorted from all parts of the Hellenic world, seeking cures. The site of this temple was a plain surrounded by mountains, about 5 m. w. of the town, and which is still called Hieron, the sanctuary. E. had also numerous temples, among which were those of Artemis, Dionysus, Aphrodite, and Hera, and a magnificent theatre, at present in a more perfect state of preservation than any in the Peloponnesus, and with sufficient accommodation for 12,000 spectators.

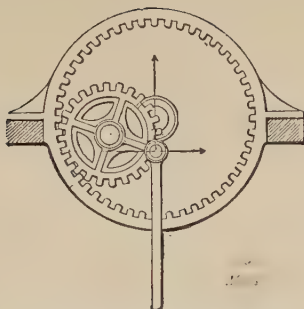
E. (modern Greek, *Epidauro*) is now a small village, with scarcely 100 inhabitants, employed for the most part in raising vegetables for the Athenian market. The plain surrounding the village is productive and highly cultivated. Here, 1822, Jan., a congress from all parts of Greece assembled, and promulgated the constitution, known as the constitution of Epidaurus.

EPIDEICTIC, a. *ēp-i-dik'tik*, or **EPIDEICTICAL**, a. *-āl* [Gr. *epideiknumi*, to show off—from *epi*, and *deiknumi*, to show]: showing off; displaying; specifically, applied to elaborate eulogiums or set orations, such as were frequent among the Athenian orators, and of which Socrates gives the best examples.

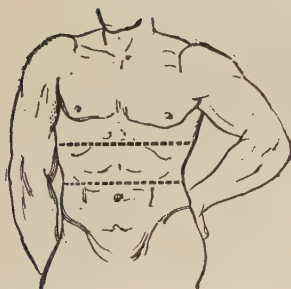
EPIDEMIC, a. *ēp'i-dēm'ik*, or **EPIDEMICAL**, a. *-ī-kāl* [Gr. *epi*, upon; *dēmōs*, the people: F. *épidémique*]: attacking many persons; prevailing generally; affecting great numbers. An *Epidemic* is a disease which attacks numbers of persons in one place simultaneously or in succession, and which in addition is observed to travel from place to place, often in the direction of the most frequented lines of communication. Many epidemic diseases are also contagious, and all suggest the necessity of careful inquiry into the ventilation, drainage, food, drink, and habits of the persons liable to be affected. See **HEALTH**. **EPIDEMICALLY**, ad. *-lī*. **EPIDEMIOLOGY**, n. *ēp'i-dēm'ī-ōl'ō-jī* [Gr.



Ephod.



Epicycloidal Wheel.



Epigastrium.



Epiglottis.



Epigynous Stamens of *Philadelphus coronarius*.



Epipactis: 1, Lip; 2, Column.

EPIDEMIC CEREBRAL MENINGITIS.

logos, discourse]: doctrine of epidemic diseases; method of investigating such diseases. EP'IDEM'IOLOG'ICAL, a. -ō-lōj'ī-kāl, connected with or relating to, epidemic diseases. EPIDEMIOGRAPHY, n. ĕp-ī-dēm-ī-ōg'ra-fī [Gr. *graphō*, I write]: treatise on epidemic diseases. *Note.*—*Epidemic diseases* are not of a permanent character, are due to contagion, or are carried by the atmosphere, and follow a track more or less wide; whereas *endemic diseases* are connected with certain local conditions, and are more or less permanent in a district. See ENDEMIC: also CONTAGION: INFECTION: FEVER; CHOLERA: ETC.

EPIDEMIC CEREBRAL MENINGITIS: disease noticed and described by many American physicians since 1811, when Dr. North specially drew the attention of the profession to it. In 1838–40, it appeared in France, and committed great ravages in Versailles, where the mortality was 28 per cent.; in Strasburg, where the mortality was 42 per cent.; in Lyon, Nancy, and other garrison towns. The patients, in these cases, were almost entirely young conscripts; and the disease was regarded as non-infectious. In the spring of 1846, it appeared in the Dublin and Belfast workhouses, boys under 12 years of age being the only victims. In 1863, it was very fatal in the United States. In 1865, it ravaged West Prussia: of 2,000 cases recorded, half died; and of 347 cases, 330 were under 14 years of age. In the United States, two forms of the disease are recognized—one marked by shock, weak pulse, purpled limbs, and coma, death happening within the first day; the other presenting signs of cerebro-spinal mischief, such as tetanoid spasms; death here occurred in three days. Purple spots were present in 27 out of 44 cases.

A form of the disease is the *Black Death*, which, 1866, 7, caused intense alarm in Ireland. A healthy medical student, aged 19, residing in Dublin, fell ill with chilliness and *malaise*, 1866, Mar. 18, abt. noon. When he was visited in the evening, it was found that he had vomited frequently and was very prostrate; purple blotches appeared on his skin during the night, and about noon next day, he suddenly fell into stupor, and was dead at two, or about 26 hours from the apparent commencement of the symptoms. A girl, aged 18, presented similar symptoms Apr. 2. but recovered. Fatal cases were recorded May 12, 13, and 17. According to Dr. Mapother, 63 fatal cases had been registered (before July 1) in the Dublin district, exclusive of eight deaths among soldiers. The symptoms include two types of very different severity. In the graver, life is rapidly extinguished as if by a blood-poison; in the milder, the symptoms are those of inflammation of the cerebro-spinal axis, or its membranes. Dr. Stokes, however, regards these latter phenomena as secondary to the essential disease, and believes that they will always appear, if the patient lives long enough for their development. The earliest symptoms are chilliness and a sense of impending danger, and vomiting of a persistent character soon follows. There is constipation till shortly before death, when the evacua-

EPIDEMIC MENTAL DISEASES.

tions are involuntarily discharged. The tongue is dry; the pulse abnormally compressible, and usually over 100. The dark purple blotches, caused by the escape of dissolved hematin (coloring matter of the blood) from the smaller vessels, are situated in and under the true skin of the legs, hands, face, back, and neck. These patches vary in size from that of a pin's head to that of a walnut, and are often sufficiently raised to be detected by the touch. The skin is dusky and moist, sometimes even bathed in sweat. In some cases, stupor, and in others, delirium and intense restlessness, are the forerunners of death. The rapidity with which this disease runs its course is appalling. A healthy boy, aged 10½ years, sank in less than five hours from the time of his seizure; and of 41 investigated fatal cases, 14 terminated within 24 hours. Of these cases, 21 were females, 20 males. Youth predisposes very strongly to the disease. No position in life affords exemption; one young nobleman, three medical students, two undergraduates, and several inhabitants of the lowest hovels—the seats of typhus and cholera—were among the victims.

With regard to treatment, almost every kind has been tried, and each has been found equally unavailing. The external application of cold to the spine and head, as advocated in various forms of disease by Dr. Chapman, deserves a trial. Dr. Mapother suggests that the disease is due, like scurvy, to the want of fresh vegetables as an article of food; and if this view is correct, this terrible malady is preventable. See MENINGITIS.

EPIDEMIC MENTAL DISEASES: morbid states of mind pervading a community. When we consider how ordinary and normal thoughts and emotions spread from one man to many, and sway multitudes to the same views and actions, we are not surprised at mental epidemics—such as, at times, spread from man to man, and involve whole nations. Such a disorder depends for its propagation, like physical epidemics, first on external circumstances, secondly, on the peculiar condition or constitution of the individuals affected. Like the bodily affection, the causes which provoke the insanity and the tendency to be affected may have been in process of development for years. Both attack the weak rather than the strong; both exist for a season, and disappear. In the case of the mental malady, the external influences—those which constitute the moral atmosphere—are ignorance, the power of one mind over another, the influence of language, the diffusion of particular opinions, the tendency to imitate. Probably, physical causes also are greatly efficient. In 1842 and 44, there occurred in Germany and France, among the military, epidemics of meningitis with delirium, or inflammation of the membranes of the brain, when no moral factors were at work, but when diet, temperature, etc. were. But even where the origin cannot be so distinctly traced, the co-operation of external as well as moral and psychical agencies may be legitimately predicated. It would accordingly be illogical to limit the production of the dancing

EPIDENDREÆ.

mania (q.v.), which occasionally, during several centuries, swept over Europe, to the reaction succeeding the dread of the end of the world, which had previously prevailed epidemically. An examination of about a hundred manifestations such as that alluded to, collected from various sources, demonstrates that not merely the intoxication of joy, but the most absurd forms of belief—that dreams, delusions, superstitions, corruptions of language, all instincts and passions, even movements and cries—may assume the form, and to a certain extent follow the laws of epidemic disease. From distant ages, there are records of a histrionic plague, when, after a summer of intense heat, multitudes conceived themselves players, and traversed the streets, and sank and died, repeating verses, and exhibiting extravagant gesticulations; of whole communities stricken with nightmare, which was so general as to be deemed contagious. There have been epidemics of homicidal and suicidal mania. In one age, hundreds were found possessed by Satan so far at least as their own belief and behavior went; in another, larger numbers supposing themselves changed into wolves; and in recent times, the leaping ague of Forfarshire, and outbursts of pyromania in various places, remind us of Bp. Butler's question: What is to prevent a whole nation becoming mad? The instances of epidemic mental disease recorded in the following table, have been selected from a vast number, with a view of showing not the frequency or extent of such affection, but the range of the phenomenon through the powers and propensities of our nature.

Popular Name.	Form of Disease.	Year.	Number Affected.	Authority.
St. Vitus's Dance....	Choreomania...	1374	Hundreds	Hecker
St. John's Dance.....	Lycanthropia...	1523	"	Calmiel
Wolf-madness.....	Demonomania...	1642, etc.	"	"
Possession.....	Theomania.....	1731	"	"
Convulsionaries of { St. Medard.....}	Pyromania.....	1800	Many	Marc
Incendiarism.....	Demonopathia...	Various	Thousands	Various
Witchcraft.....	Melancholia.....	"	"	Esquirol
Suicide.....	Delusions.....	"	Many	Brierede Boismont
Visions.....	Panphobia.....	1845	Many	Edin. Review 1849
Timoria, Panic. ...				

There appears to be no guarantee that the present and future generations shall be exempted from similar visitations, except in the general establishment of soundness of body and spirit.—Hecker's *Epidemics of the Middle Ages*; Calmiel, *De la Folie considérée sous le Point de Vue Pathologique, Philosophique, Historique et Judiciaire, depuis la Renaissance des Sciences en Europe jusqu'au dix-neuvième Siècle*, etc., and *Psychological Journal*, *passim*.

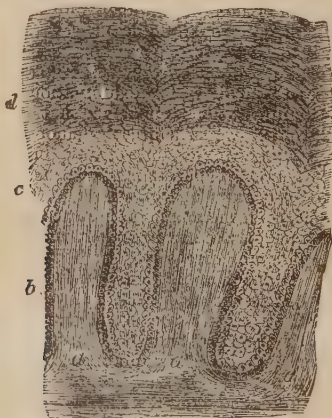
EPIDENDREÆ, n. ĕp-i-dĕn'drĕ-ĕ: tribe of orchids. It comprises those genera which have the pollen masses waxy; a distinct candicle, but no separate stigmatic gland. EPIDENDRUM, n.-drŭm [Gr. *epidendrios*, on or in a tree—from *epi*, upon; *dendron*, a tree]: general term for an orchid of whatever genus growing on trees; an epiphytal

EPIDERMIC.

orchid. *Epidendrum* is the name of a large genus of S. American orchids, family *Labiadæ*, and the typical genus of the tribe *Epidendreæ*. More than 300 species are known, most of them epiphytal on trees, but some terrestrial. Many are beautiful, especially *E. nemorale*. *E. bifidum* is said to be purgative, anthelmintic, and diuretic. Two specimens are found in the United States: *E. conopseum*, on magnolia trees in S. C., Ga., and Fla.; and *E. venosum*, in Fla.

EPIDERMIC, a. *ép'i-dér'mik* [Gr. *epi*, upon; *derma*, skin] pertaining to the outer skin or cuticle; also EP'IDER'MAL, a. -*dér'mál*. EP'IDER'MIS, n. -*mís*, or EPIDERM, outer skin of the body; the cuticle; the outer coating of a plant or tree. In the body, it is a semi-transparent membrane, containing neither vessels nor nerves, and everywhere forming an external covering to the corium or true skin: see SKIN. The epidermis is called in ordinary language the *scarf-skin*. It consists of two layers, chemically and morphologically distinct—the *mucous layer*, which lies immediately upon the corium, and the *horny layer*, which forms the outermost surface of the body.

The *mucous layer* (known formerly as the *rete mucosum s. Malpighianum*) is of a whitish or slightly brown tint (in the Negro, dark gray or black), and is composed of small soft cells. The innermost of these cells, resting on the



Perpendicular Section of the Skin of the Leg of a Negro: Magnified 250 diameters.

a, a, papillæ of the cutis; *b*, deepest intensely colored layer of perpendicularly elongated cells of the mucous layer; *c*, upper stratum of the same layer; *d*, horny layer.

surface of the corium, are elongated and arranged perpendicularly; upon these follow elongated or roundish cells in many layers, which, in proportion to their distance from the corium, acquire, from their mutual pressure, a polygonal form, which may even be recognized in individual cells.

EPIDERMIC.

All the cells in the mucous layer are nucleated vesicles distended with fluid, and likewise containing minute granules, which diminish in number in the more external cells.

The *horny layer*, the external semi-transparent part of the epidermis, in the white races is colorless; it is composed almost wholly of uniform cells, metamorphosed into plates or scales. The deepest plates in some degree resemble the uppermost cells of the mucous layer; but in the second or third layer the flattening begins; till at length, after a gradual series of modifications, the hard, horny scales occur on the surface, where they are regularly cast off with more or less rapidity, and replaced by those beneath them. In reptiles and amphibians, this layer is periodically cast off in a more or less entire state, a new one being previously formed beneath it; and in man, desquamation in large patches often occurs after certain diseases, especially scarlatina.

The color of the epidermis differs in different persons and in different parts of the body. It is deepest around the nipple, especially in women during pregnancy and after they have borne children. A more or less dark pigment is often deposited, in persons who are exposed to the sun, in the face, neck, back of the hands, etc. These tints are not produced by special pigment-cells, but are seated in the common cells of the mucous layer, round whose nuclei granular pigment is deposited. In the Negro and the other colored races, it is also only the epidermis which is colored, while the *corium* completely resembles that of European races. The perpendicular cells (see *b* in the figure) are the darkest, and form a sharply marked fringe at the edge of the clear corium. To these succeed brown cells, which accumulate in the depressions between the pupillæ, and the approach to the horny layer shows yellowish cells. The horny layer of the Negro also inclines to a yellow or brownish tint.

Morbid coloration of the epidermis (freckles, mother's marks, etc.) is produced in the same way as the color of the Negro's skin. Numerous instances are on record, of partially or entirely white Negroes and of black Europeans, not as a consequence of change of climate but as an abnormal condition of the skin.

The thickness of the epidermis varies extremely. While on the cheeks, brow, and eyelids, it varies from $\frac{1}{75}$ th to $\frac{1}{50}$ th of a line, on the palm of the hand it ranges from $\frac{1}{3}$ d to $\frac{1}{2}$ a line, and on the sole of the foot sometimes even exceeds a line. In some parts of the body the horny layer is thicker than the mucous; in other, the mucous is the thicker of the two. As the chief use of the epidermis is for protection to the soft and tender subjacent parts, it attains its greatest thickness on those portions of the body (palm of the hand and sole of the foot) most exposed to pressure and friction.

In *plants*, as in animals, the epidermis is formed of flattened cells, of which also new layers are continually produced from the bark below, while the outer ones dry up,

EPIDOSYTE—EPIGASTRIC.

lose their vitality, and peel off, crack and split off, or otherwise become separated from the living organism. The cells of the epidermis are often enlarged outward, so as to form projections, sometimes very slight, sometimes elongated into hairs (q.v.). Glands (q.v.) also are connected with the epidermis, sometimes by the intervention of hairs, sometimes without, and in this way it contributes to the secretion of substances formed in plants by the wonderful chemistry of nature, and on which their value to man often greatly depends. The cells of the epidermis are usually filled with a colorless fluid, but resinous and waxy substances are sometimes found in them, and sometimes silica (as in grasses and *Equisetaceæ*), sometimes carbonate of lime (as in the *Charas*). The epidermis is pierced by *stomata* (q.v.). When the epidermis of plants is subjected to prolonged maceration, it can often be made to separate into two parts; one, more strictly called the epidermis, being the inner, lower, and thicker membrane; the other, the *Pellicle* or *Cuticle*, being very thin, and extending continuously over every part of the plant except where it is pierced by the stomata. Thus, this superficial pellicle invests even the finest hairs. In some of the *Algae*, it seems to constitute the whole integument. In the greater number of plants, the epidermis is thin and soft, but sometimes it is thick, and sometimes hard.

EPIDOSYTE, n. *ép-i-dō'sīt* [Gr. *epidosis*, a giving over and above; increase]: rock consisting, in 100 parts, of 61·33 epidote and 38·22 quartz. It is found in parts of Canada.

EPIDOTE, n. *ép'i-dōt* [Gr. *epi*, upon; *didōmai*, I give or add to; *didōtai*, it gives or adds to]: mineral allied to garnet, composed of silica and alumina, with a considerable proportion of lime, or of peroxide of iron, or of peroxide of manganese. These diversities of composition constitute three very distinct varieties; and of these there are sub-varieties, differing in color and other particulars (*Pistacite*, *Bucklandite*, *Withamite*, *Zoisite*, etc.). E. is found sometimes massive, foliated, columnar, granular, or incrusting; often crystallized. Its crystals are prisms, variously modified. Its prevalent colors are green, yellow, and gray, but some varieties are red and black. It is found in gneiss, syenite, trap, and other rocks in many parts of the world.

EPIGÆA REPENS, *ép-i-jē'a rēp'ēnz* (TRAILING ARBUTUS, or MAYFLOWER): one of the earliest spring flowers in the United States, belongs to the *Ericaceæ*, and is prized for its beauty and fragrance. It is indigenous to the n.e. states, along the Atlantic coast line, and the interior of Conn., Mich., Wis., Minn., and several of the s. states, where it is known as ground laurel; and medically is a strong diuretic. The pilgrim settlers found it abundant in the Plymouth woods, a welcome harbinger of spring before all the snow of their first dreary winter had gone.

EPIGÆOUS, a. *ép'i-jē'ūs* [Gr. *epi*, upon; *gē*, the earth]: in *bot.*, growing on land in contradistinction to growing in the water; growing close to the earth. **EPIGÆAL**, a. *-jē'āl*, above ground.

EPIGEE—EPIGONATION.

EPIGEE, n. *ěp'î-jě* [Gr. *epi*, upon; *gē*, the earth]: the point of a planet's or satellite's orbit nearest to its primary: same as **PERIGEE**, which see.

EPIGENE, a. *ěp'î-jěn* [Gr. *epi*, upon; *gennaō*, I produce]: in *mineral.*, having undergone alteration in its chemical character while retaining the same crystalline form as before, foreign to the position which the crystals at present occupy; pseudomorphic.—In *geol.*, E. signifies originating on the surface of the earth, as distinguished from hypogene rocks like granite, of which Lyell's hypothesis is that it originated at a considerable depth below the surface.

EPIGENESIS, n. *ěp'î-jěn'ě-sis* [Gr. *epi*, upon; *genēsis*, generation]: formation upon, or in addition to, previously existing parts. The word is applied in physiology to that theory of new formations in organized beings which supposes them to spring from superadded centres of vital activity, as opposed to the theory which presumes that the new is formed by an evolution or development or modification of the old structure. See **REPRODUCTION**.

EPIGENOUS, a. *ě-pij'ěn-ūs* [Gr. *epigenēs*, in class. Gr. growing after or late, but here used for growing upon living bodies: *epi*, upon; *genos*, race, stock (?): in *bot.*, growing upon the surface of a plant, or part of it. Thus many fungals grow on the leaves of plants.

EPIGEOUS, or **EPIGÆUS**, n. *ěp-î-jě'ūs* [Gr. *epigeios*, on or of the earth; *epi*, upon; *gē*, the earth]: in *bot.*, living close upon the earth.

EPIGLAUBITE, n. *ěp-î-glau'bit*: in *min.*, variety of metabrushite (q.v.).

EPIGLOTTIS, n. *ěp'î-glōt'tis* [Gr. *epi*, upon; *glottis*, the mouth of the windpipe—from *glotta*, the tongue]: the valve or cartilage that covers the upper part of the windpipe when food or drink is passing into the stomach: see **LARYNX**. **EPIGLOT'TIC**, a. *-glōt'tik*, pertaining to.

EPIGÆA REPENS, *ěp-î-jě'a řěp'ěnz* (**TRAILING ARBUTUS**, or **MAYFLOWER**): one of the earliest spring flowers in the United States, belongs to the *Ericaceæ*, and is prized for its beauty and fragrance. It is indigenous to the n.e. states, along the Atlantic coast line, and the interior of Conn., Mich., Wis., Minn., and several of the s. states, where it is known as ground laurel; and medically is a strong diuretic. The pilgrim settlers found it abundant in the Plymouth woods, a welcome harbinger of spring before all the snow of their first dreary winter had gone.

EPIGONATION, n. *ěp-î-go-nā'ti-ōn* [Gr. *epigonatis*, the kneepan, also a garment reaching to the knees;—from *epi*, upon; *gonatos*, the knee]: lozenge-shaped piece of some stiff material, which forms part of the dress of bishops in the Greek Church while officiating. It hangs from the girdle on the right side as low as the knee, and is supposed to represent the napkin with which our Lord girded himself at the Last Supper.

EPIGONE—EPIHYAL.

EPIGONE, n. *ĕ-pig'ō-nē* [Gr. *epi*, upon; *gōnē*, the seed, offspring]: in *bot.*, the cellular layer which covers the young seed-case in mosses, etc.

EPIGONI, n. plu. *ĕ-pig'ō-nī* [Gr. *epi*, upon; *gōnē*, seed, offspring]: those after-born; a mixed race; particularly applied to the children of the soldiers of Alexander the Great by Asiatic women.

EPIGRAM, n. *ĕp'ī-grām* [F. *épigramme*—from L. *epigramma*, an inscription—from Gr. *epi*, upon; *gramma*, a writing]: very short poem on one subject ending with a witty or ingenious turn of thought; the epigrams of the Greeks were simply inscriptions in verse on tombs, statues, and monuments, marked by great simplicity of style, but having little in common with what now passes under the name. It was among the Romans that the epigram first assumed a satirical character. Catullus and Martial are reckoned the best Latin epigrammatists. In modern times, an epigram is understood to be a very short poem, generally two to eight lines, expressing an ingenious thought in pointed phraseology, usually reserving the essence of the wit to the close, as the serpent is fabled to carry its sting in its tail. The French excel all other nations in this kind of poetry. Their earliest epigrammatist of any note was Clement Marot (1495–1544); their best are Boileau, Voltaire, and Piron. The epigrams of German writers are for the most part happily expressed moral proverbs, but the *Xenien* of Schiller and Goethe contain not a few sharp and biting verses of a satirical character. In Britain, Pope, Burns, Byron, Moore, and other writers have shown remarkable power of epigrammatic satire. **EP'IGRAMMATIC**, a. *-măt'ik*, or **EPIGRAMMATICAL**, a. *-ī-kāl*, like an epigram; concise; pointed (not necessarily always in verse). **EP'IGRAMMATIST**, n. *-grām'mā-tist*, a writer of epigrams. **EP'IGRAMMATICALLY**, ad. *-lī*.

EPIGRAPH, n. *ĕp'ī-grāf* [F. *épigraphe*—from Gr. *epi*, upon; *graphō*, I write]: in *architecture*, a terse inscription on a monument or other building, to denote their use or appropriation—frequently wrought into the ornamental details of the structure. In *literature*, a citation from some author, or a sentence constructed for the purpose, placed as a motto at the commencement of a book, or at the beginning of each chapter or part. **EPIGRAPHIST**, n. *ĕ-pig'ra-fist*, one who studies or is versed in epigraphy. **EPIGRAPHY**, n. *-fī*, study of inscriptions; that branch of science which deals with the deciphering and explanation of inscriptions.

EPIGYNOUS, a. *ĕ-pīj'ī-nūs* [Gr. *epi*, upon; *gunē*, a female]: in *bot.*, having the outer whorls of the flower adhering to the ovary so that their upper portions alone are free, thus appearing to be seated on it.

EPIHYAL, a. *ĕp-ī-hī'al* [Gr. *epi*, upon; Eng. *hyoid*; suff. *-āl*]: pertaining or relating to the stylo-hyoid ligaments: N. constituting part of the lower or visceral arches, inclosing the nose, mouth, and pharynx.

EPILEPSY.

EPILEPSY, n. *ěp'ĩ-lěp'sĩ* [Gr. *epĩlēpsĩa*, a seizure, the falling sickness—from *epĩ*, upon; *lambánein*, to take: F. *épilepsie*: L. *epilepsĩa*: It. *epilessia*]: the falling sickness; a kind of sudden fit, with convulsions. **EP'ILER'TIC**, a. *-tĩk*, affected with falling sickness: N. one affected with epilepsy. **EP'ILER'TICAL**, a. *-tĩ-kál*, pertaining to epilepsy.—*Epilepsy* is a form of disease characterized by sudden insensibility, with convulsive movements of the voluntary muscles, and occasionally arrest of the breathing, owing to spasm of the muscles of respiration, and temporary closure of the glottis (q.v.). Epilepsy was called by the ancient Greeks the 'sacred disease.' Owing to the mysterious and extraordinary character of the convulsion, it was always, in ancient times, supposed to be due specially to the influence of the gods, or of evil spirits; Hippocrates, however, combats this idea in a treatise, in which he maintains that epilepsy is no more and no less divine than all other diseases. The notion of the specially supernatural character of epilepsy is cognate to the deeply rooted oriental belief of demoniac possession: see **DEMONIACS**. Epilepsy is often called, in modern language, the 'falling sickness,' descriptive of one of its most striking phenomena, and pointing to the most obvious danger of the fit. The patient is seized, without reference to his condition or occupation at the moment, with insensibility, often so complete and sudden as to lead to serious accidents and bodily injuries; in the most aggravated cases, he has no premonitory sensations whatever, but falls down without any attempt to save himself, and usually with a wild inarticulate cry of some kind, immediately after which the face is violently distorted, the head drawn toward one or other shoulder, and the whole body convulsed. These convulsions follow in rapid succession for a few minutes, and are attended by foaming at the mouth, and by great lividity, or, in some cases, livid pallor, which, with the irregular spasmodic movements of the lips, nostrils, and eyes, give a frightfully ghastly expression to the countenance, and almost invariably lead the bystanders to an exaggerated idea of the immediate danger of the fit. The immediate danger is, in reality, not great, excepting that the sudden attack may lead to an injurious or fatal fall; the tongue, however, may be bitten if protruded during the convulsion, or the patient may be so placed as to injure himself seriously by the repeated and unconscious movement of his body, or he may suffocate himself by accidentally falling with his face in water, or otherwise closing up the mouth and nostrils, or by dragging upon a tightened neckcloth. Care should be always taken to avoid these accidents by keeping the epileptic as much as possible within view of persons acquainted with his condition, and able to assist him; as well as by warning the patient himself to avoid places of danger. Beyond the obvious precautions indicated above, there is almost nothing to be done for the patient; and any attempt to rouse him by violent stimuli, as ammonia applied to the nostrils, or by dashing water in the face, or, still more, by any internal administration, is likely to do more harm than

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good. The tongue should be looked to, a piece of cork or other gag being, if necessary, inserted between the teeth; the patient should be then placed on a mattress or other soft place near the ground; his neckcloth should be removed, and the dress loosened round the chest; the head should be, if possible, a little raised, and a free circulation of air maintained (this last precaution being apt to be neglected in a crowd). The ordinary course of the fit (which usually lasts five to twenty minutes altogether) is as follows: the convulsions gradually diminish in intensity, and the patient passes into a state of deep but motionless stupor, with dilated pupils, and sometimes, but not always, with snoring or noisy breathing; the foaming at the mouth ceases, the color gradually returns, and this state leads to recovery through a more or less protracted, but apparently natural sleep, the patient, on awaking, being often quite unconscious that he has been the subject of any anxiety, or, indeed, in any unusual condition whatever. Although in all cases of true epilepsy there is a stage of complete coma (q.v.), or unconsciousness, yet the fit is often very transient, and but little attended by convulsion, being also less sudden than above described, and not necessarily causing a fall to the ground; in some cases, also, fits of greater intensity are preceded by certain premonitory symptoms or peculiar sensations, which act as warnings to the patient himself. The French language, popular and scientific, has adopted the terms of *grand mal* and *petit mal* (i.e., great and little evil), as characterizing the more and less dangerous forms of epilepsy respectively. The sensations which precede the fit in some epileptics have been termed in Latin the *aura* (i.e., breath) *epileptica*, from their supposed resemblance to a current of cold air passing over the body, and proceeding from the extremities toward the head. This description does not, however, hold good in all cases; and frequently there is no *aura*, or unusual sensation of any kind, preceding. However, some of the most ancient authorities assert strongly the power of a tight bandage, placed suddenly upon the limb in which the aura begins, to cut short, or even to prevent, the fit; and this alleged fact has never been altogether discredited, and has of late years been brought into renewed notice by good observers. It is even maintained by some that such a bandage, placed experimentally upon one or other of the limbs, and tightened on the approach of a fit, has been found effective in some cases in which there was no distinctly local sensation; and epileptics have been repeatedly convinced of the propriety of habitually wearing a bandage loosely applied upon the arm, which they have been able, by carefully watching their own sensations, and by being watched by others, to get tightened at the proper time. If this view be fallacious, there is at least no risking in acting on it.

But the fit and its treatment form only a part of the anxieties which arise out of a case of epilepsy. The ultimate danger of the disease has little relation to the severity of the individual fits; the frequency of the attacks being apparently much more apt than their character to influence

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the duration of life. Indeed, though epileptics may survive several severe paroxysms at distant intervals, and recover in the end with an apparently unbroken constitution, it rarely happens that very frequently repeated attacks, even of the *petit mal*, are unattended by some permanent depreciation of the powers of mind or of body. The most frequent, perhaps, of the serious consequences is insanity (q.v.), sometimes assuming the form of acute mania or monomania following the attacks, but quite as frequently tending to gradual imbecility without any acute seizure. Sometimes the development of the epileptic insanity, or dementia, is attended by palsy, and other indications of structural disorder of the brain; in other instances, no such consequences occur, and the brain after death may be found to have very little tangible disease. Very often, even when the mind remains tolerably entire, there is loss of memory, and a certain want of acuteness and depression of spirits, which unfit the individual for the regular business of life. Disorders of the digestion are also not uncommon; and there is frequently a want of tone and vigor in all the bodily functions, inducing languor and reserve.

The causes and the radical cure of epilepsy are almost equally involved in mystery. It has been supposed by some to be dependent on an increased afflux of blood to the brain; by others it has been attributed, with about equal reason, to precisely the opposite condition. Certain cases undoubtedly depend upon organic disease, as tumors or injuries to the brain and its membranes, more especially near the surface. Local sources of irritation in other parts of the body also have been supposed to be exciting causes; and cases are recorded in which the disease has been cured by the amputation of a finger or the division of a nerve. The attention of recent observers has been especially directed to the medulla oblongata and spinal cord (q.v.), as being the most probable physiological seats of a disease so decidedly marked by convulsive movements. But as yet little more than the most vague theoretical inferences can be drawn from their researches as to the cause of either the epileptic tendency or paroxysm. One of the most suggestive of recent observations is the experiment of Brown-Sequard, showing that epilepsy, or a state closely resembling it, may be induced in certain animals by division of certain portions of the spinal cord, the artificial disease continuing long after the primary effects of the injury have ceased. A still more inexplicable phenomenon has resulted from the multiplication of such experiments; for Brown-Sequard has shown that in guinea-pigs this artificial epilepsy is sometimes propagated to the offspring, becoming, like the natural disease, a hereditary and congenital morbid tendency. On these strange and important facts speculation at present is premature.

The condition of the epileptic seems favorably affected by everything which conduces to a quiet and hopeful state of mind, and to vigor of body. The treatment should therefore in general be of the kind termed *tonic* (q.v.), and should be adapted with care, and after very minute

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and careful inquiry, to the removal of all special bad habits, and occasional causes of depression of the system. The influence of a happy and quiet domestic life, without unhealthful excitement, and with proper occupations, varied by amusement and exercise in the open air, will tend to prevention of attacks. The marriage of epileptics has been known in some cases to increase the disease, and to involve its transmission to a considerable number of children. Yet a too absolute rule on this subject is not without its dangers. If the tendency exist, even slightly developed, on both sides, marriage must be regarded as in high degree imprudent. Any reserve or concealment on this subject on either side, is a dishonorable deception.

According to one of the oldest and most respected of American physicians (Dr. Jackson of Boston), the epileptic tendency may often be successfully treated by systematic and exclusive vegetable diet, or by large reduction of the proportion of animal food. Among the innumerable remedies recommended by authorities, the salts of iron and zinc have perhaps the largest amount of experience in their favor; and counter-irritants (q.v.) applied to the nape of the neck, or between the shoulders, either by blistering, the use of the seton, or even actual cautery, has often been followed by prolongation of the intervals, or decrease in the severity of the fits. Almost all the accredited remedies, however, have been observed to produce a temporary relief of this kind, even when without any permanent influence on the course of the disease.

Some of the *Lower Animals* are subject to epileptic fits. The disease is common in dogs and highly bred pigs. The creatures writhe with involuntary spasms, and are for the time without sight or hearing. Sometimes the muscles of the throat are so involved that fatal suffocation occurs. The attack is generally preceded by dulness, and lasts 10 to 30 minutes. It is generally traceable to torpidity or irregularity of the bowels, worms, debility, or plethora. In dogs, it is a frequent sequel of distemper. In cattle, it occurs usually in connection with the engorgement of the first or third stomachs; they throw themselves violently about, bellowing loudly, but seldom die. It is rare in horses, and differs from megrims, for which it is often mistaken, but in which there are no spasms. The treatment consists in freely opening the bowels, removing worms, if any are present, resorting to bleeding and spare diet, if the animal's condition is high, and generous feeding and tonics if it is low. The best preventives are carefully regulated diet, an occasional laxative, with a course of tonics, especially of arsenic.

EPILOBE: see EPILOBIUM.

EPILOBEÆ: see EPILOBIUM.

EPILOBIUM, *ἔπι-ῖ-λω'βι-ἄμ*: genus of plants of the nat. ord. *Onagraceæ*, having four deciduous calycine segments; four petals; a much elongated, 4-sided, 4-celled, 4-valved, many seeded capsule; and seeds tufted with hairs at one end. The species are herbaceous perennials, natives of tem-

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perate and cold countries, and very widely diffused both in the n. and in the s. hemisphere. Some are very ornamental from the beauty of their flowers. Most of the Amer. species have small flowers, and some of them are very common in moist places. *E. angustifolium*, which has the



Epilobium Angustifolium:

, a flower; 2, a longitudinal section of a flower, showing the arrangement of the ovules in the germen; 3, a seed.

petals dissimilar in shape and size, is frequently planted in gardens and shrubberies for its numerous and beautiful rose-colored flowers; but its creeping roots are apt to overrun a flower-garden. It is sometimes called FRENCH WILLOW, from the resemblance of its stems and leaves to some kinds of willow, and the name WILLOW-HERB is often extended to the whole genus. It is found in far northern regions, and its leaves and young shoots are sometimes a grateful addition to the meals of the arctic traveller. The pith, when dried, yields a quantity of sugar to boiling water, and is used in Kamtchatka for making a kind of ale, from which also vinegar is made.

EPILOGUE, n. *ép'i-lŏg* [F. *épilogue*—from L. *epilŏgos*; Gr. *epilŏgos* a close or conclusion]: in *oratory*, the summing up or conclusion of a discourse. In connection with the drama, a short speech in prose or verse which frequently, in former times, was subjoined to plays, especially to comedies. The epilogue was always merry and familiar in its tone, and was intended to establish a kindly understanding between the actor and the audience, as well as to conciliate the latter for the faults of the play, if there were any, and to send them away in good-humor. One of the neatest

EPIMACHUS—EPINAL.

and prettiest epilogues ever written, a complete model of what an epilogue should be, is that spoken by Rosalind at the conclusion of Shakespeare's *As You Like It*. **EPILOGISTIC**, a. *ĕp'ĭ-lō-jis'tik*, of or like epilogue.

EPIMACHUS, *ĕ-pĭm'a-kūs*: genus of birds, natives of Australia and Papua, often improperly classified with birds of paradise. The *E. albres*, of Australia, is of violet-black color, with green-tipped feathers around the neck, and long, white, silky plumes growing from back and rump. The *E. magnus*, of Papua, is of black-brown color, and has a body 12 inches long and a tail 3 ft. long, and a head and belly of beautiful blue.

EPIMEDIUM, n. *ĕp-ĭ-mē'di-um* [L. *epimedium*, a plant, by some supposed to be *Marsilea quadrifolia*: Gr. *epimēdion*, barrenwort]: in bot., barrenwort; genus of berberids, tri-*Nandineæ*. *E. alpinum* (Alpine Barrenwort) is found in rock-works, old castle gardens, etc.

EPIMENIDES, *ĕp-ĭ-mēn'ĭ-dēz*: Greek poet and priest at Crassus; b. probably at Phæstus in Crete, B.C. 6th or 7th c. His history has reached us in only mythical form. He is said to have fallen asleep in a cave when a boy, and not to have wakened for 57 years. Like Rip Van Winkle, he was naturally much astonished and perplexed on his return to broad daylight. His period of slumber, however, had not passed away unprofitably. His soul, disengaging itself from its fleshly prison, betook itself in the interval to the study of medicine and natural philosophy; and when it had taken on again its mortal coil, E. found himself a man of great knowledge and wisdom. Goethe has written a poem on the subject, *Des Epimenides Erwachen*. E. went to Athens about B.C. 596, where, by the performance of various mystical rites and sacrifices, he was said to have stayed a plague with which the inhabitants were afflicted. When he died is not known, but we may be certain that he did not live (as is fabled) 299 years. That he wrote the epic poems attributed to him, the longest of which was on the Argonautic expedition, is highly improbable. Compare Heinrich, *E. aus Kreta* (1801).

EPIMERAL, n. *ĕp'ĭ mē'rāl* [Gr. *epi*, upon; *mērōs*, the upper part of the thigh]: that part of the segment of an articulate animal which lies immediately above the joint of the limb. **EPIMERA**, n. plu. *ĕ-pĭm'ĕ-rā*, the parts lying immediately above the joint of the limb, as the *epimera* or side segments of the lobster.

EPINAL, *ā-pē-nāl*: town of France, dept. of Vosges, in a delightful district at the w. base of the Vosges Mountains, on both banks of the Moselle, about 200 m. e.s.e. of Paris; lat. 48° 10' n., long. 6° 26' e. It is a well-built, handsome town, with clean, regular, though badly paved streets, and is surmounted by the ruins of an old castle, the gardens attached to which are much admired. Among its chief buildings are the parish church, an antique Gothic structure; the hospital, formerly a Capuchin convent; a museum of pictures, antiquities, and natural history; the barracks;

EPINAY—EPIPACTIS.

and the residence of the prefect of the department. **E.** manufactures chemical products, lace, block-tin, wrought-iron, pottery, cutlery, paper, and leather, and has some trade in grain, wine, timber, etc. Pop. (1891) 23,223.

ÉPINAY, *â-pe-nâ'*, LOUISE FLORENCE PÉTRONILLÉ DE LA LIVE D': French writer: 1725-83. At the age of 19, she married her cousin, M. d'Épinay, but the union was not happy. While her husband was abandoning himself to dissolute courses, she sought the intercourse of philosophers and men of genius. In 1745 she formed a close intimacy with Rousseau, and presented him with a small house (the now famous Hermitage) on one of her husband's estates in the woods of Montmorency. An unfortunate jealousy, however, which Rousseau conceived for Grimm, another friend of Madame d'E., was followed by an open rupture with his benefactress, and in his *Confessions* he scrupled not to malign her by way of vengeance. She spent the remaining 25 years of her life in comparative solitude, seeing only a small and select circle of philosophers and littérateurs. When Grimm was obliged to leave Paris, she continued, under the direction of Diderot, his literary correspondence with northern sovereigns. From the pen of Madame d'E. we have *Conversations d'Emilie* (Paris 1774), a work on education pronounced by the French Acad. to be the most useful published for a number of years; *Mémoires et Correspondance de Madame d'Épinay, renfermant un Grand Nombre de Lettres inédites de Grimm, de Diderot, et de J. J. Rousseau, etc.* (Paris 1818); *Les Confessions du Comte de ****; etc.

EPINEPHELE, n. *ěp-ĩ-něf'ě-lě* [Gr. *epinephelos*, clouded; *epi*, upon; *nephelē*, a cloud]: in *entom.*, genus of butterflies, family *Satyridae*. *Epinephele Janira* is the Meadow Brown. It is smoky-brown with a white-pupilled black spot on the upper side of the forewings; Europe. N. Amer. has a number of nearly related species, of the genera *Satyrus*, *Debis*, *Neonympha*, and *Apatura*, mostly meadow species, some woodland. The caterpillar of *Janira* is said to feed on grasses in the autumn and spring; the perfect insect is seen during hay harvest.

EPINGLETTE, n. *ěp-ĩng-glět'* [F.]: in *ord.*, an iron needle for piercing the cartridge of a piece of ordnance before priming.

EPINIKIAN, a. *ěp-ĩ-nĩk'ĩ-an* [Gr. *epinikios*]: pertaining to victory; triumphant.

EPIORNIS, n. *ěpĩ-őr'nĩs* [see **ÆPIORNIS**]: a gigantic extinct bird of Madagascar.

EPIOTIC, a. *ěp-ĩ-őt'ík* [Gr. *epi*, upon; *ōtos*, the ear]: in *anat.*, name given by Prof. Huxley to the upper bone of the auditory capsule, part of the pars petrosa in man. It is the ossific centre corresponding to the lower part of the mastoid bone. It surrounds the posterior semi-circular canal, and extends into the mastoid portion.

EPIPACTIS, n. *ěp-ĩ-pāk'tis*: a genus of orchids.

EPIPEDOMETRY—EPIPHANY.

EPIPEDOMETRY, n. *ěp-ĩ-pě-dóm'ě-trĩ* [Gr. *epipedos*, on the ground, on the ground floor, level, flat; *epi*, upon; *pedon*, the ground; *metron*, a measure]: in *geom.*, the measurement of figures standing on the same base.

EPIPERIPHERAL: see **ENTOPERIPHERAL**.

EPIPETALOUS, a. *ěp'ĩ-pět'ä-lūs* [Gr. *epi*, and *petalon*, a petal]: inserted upon the petals.

EPIPHANITE: see **EUKAMPTITE**.

EPIPHANIUS, *ěp-ĩ-fũ-nĩ-ūs*, **SAINT**: Christian bishop, and writer of the 4th c.; b. of Jewish parents in Palestine; d. 403. He was baptized in his 16th year, and was educated among the Egyptian monks, who inspired him with an aversion to all liberal science. He rose gradually to the rank of Bp. of Constantia (formerly Salamis) in Cyprus, and continued in that office from 367 till his death. His polemical zeal was conspicuously manifested against Origen. In his writings he had proclaimed him a heretic; and in 394 he went to Palestine, the focus of Origen's adherents, and called upon John, Bp. of Jerusalem, and the two monks, Rufinus and Jerome, to condemn him. A more legitimate object of his violent opposition was the increasing worship of images. Jerome relates how he indignantly tore down an image in the precincts of a church in Palestine, as being contrary to the divine law. Among his writings, collected by Petavius (2 vols. Paris 1622), the most important is his *Panarion*, or catalogue of all heresies (80 in number), a work which strikingly shows his unfitness for a historian. His credulity and want of honesty are excessive.

EPIPHANY, n. *ě-pĩf'ä-nĩ* [Gr. *epiphaneĩ'ä*, appearance—from *epi*, upon; *phainō*, I bring to light, I appear: F. *épiphanië*, epiphany—from L. *epiphānĩa*, manifestation]: among the heathen Greeks, a festival in commemoration of the appearance of a god in any particular place. The word subsequently passed into the usage of the Christian Church to denote in general the manifestation of Christ to the world, and was applied in the Eastern Church to a festival opening the Christian year and celebrating the manifestation or appearance of Christ upon the earth, with special reference first to His baptism, at which time He was proclaimed from the heavens as the glorious and eternal Son of God, and so was manifested on earth. His birth was viewed as merely a preliminary to his baptism, and both were celebrated together, Jan. 6.—the two festivals of Christmas and E. not being separated till toward the end of the 4th c. Indeed, in the Eastern Church, E. became a favorite term for Christian baptism. The festival, passing to the Western Church (recorded first in 360), was changed as to its basis, and referred to the manifestation of Christ to the Gentiles on the day when he was seen and worshipped by the three wise men who came from the East: see **MAGI**. It also ceased to be used to denote baptism. This occasion is still commemorated in large portions of the church on Jan. 6, the 12th day after Christmas; hence the E. is called

EPIPHYGUS—EPIPHYTE.

also Twelfth Day. The E. is observed as a 'scarlet day' at Oxford and Cambridge universities.

EPIPHYGUS, *n.* *ĕp'ĭ-fĕgŭs* [Gr. *epi*, upon; *phĕgos*, a kind of oak, not the Latin *fagus* (beech)]: in *bot.*, genus of *Orobanchaceæ*, Broomrapes. *Epiphegus virginiana*, a N. American parasite on the roots of the beech, is believed to have been one ingredient in Martin's cancer powder, white oxide of arsenic being another.

EPIPHLÆUM, *n.* *ĕp'ĭ-flĕ'um* [Gr. *epi*, upon, on the outside; *phloios*, bark]: an external layer of bark. **EPIPHLÆODAL**, *a.* *ĕp'ĭ-flĕ'ō-dāl*, existing superficially in the epidermis of bark.

EPIPHONEM, *n.* *ĕ-pĭf'ō-nēm*, or **EPIPHONE'MA**, *n.* *-nĕ'ma* [Gr. *epiphōnēma*, a thing uttered; *epiphōneō*, I utter; *phōneō*, I speak or utter]: in *rhet.*, exclamatory sentence or striking reflection which sums up or concludes a discourse.

EPIPHORA, *n.* *ĕ-pĭf'ō-rā* [Gr. *epiphōrā*, a bringing to or upon—from *epi*, upon; *phērō*, I bring]: watery eye, a disease in which the tears flow over the cheek from an obstruction in the canal which should carry them off; violent determination of the fluids to any part of the body, produced in general by inflammation.

EPIPHRAGM, *n.* *ĕp'ĭ-frām* [Gr. *epi*, upon; *phragma*, a division]: in *bot.*, the membrane closing the orifice of the thecæ in the urn mosses.

EPIPHYLLOUS, *a.* *ĕp'ĭ-fĭllŭs* [Gr. *epi*, *phullon*, a leaf]: inserted on a leaf, or growing upon it. **EPIPHYLLUM**, *n.* *ĕp'ĭ-fĭllŭm*, one of the cactus family; a genus of plants whose stems consist of fleshy lobes or leaf-like expansions; splendid flowering-plants, so called in allusion to the flowers growing on the flat branches, which appear like leaves. **EPIPHYLLOSPER'MOUS**, *a.* [Gr. *epi*, *phullon*, *sperma*, a seed]: having the seeds on the back of the frond or leaf. Plants of this character are now called dorsiferous ferns.

EPIPHYSIS, *n.* *ĕ-pĭf'ĭ-sĭs* [Gr. *epi*, *phūō*, I grow]: that which grows on something else; a part of a bone formed at first separately from the shaft or body, and afterward united to it.

EPIPHYTE, *n.* *ĕp'ĭ-fĭt* [Gr. *phūtōn*, a plant—from *epi*, upon; *phūō*, I grow]: plant not rooted in the ground, but growing on another, but which does not, like a parasite, derive its nourishment from the other; plant attached to another plant, and growing suspended in air; popularly, but less correctly, called **AIR-PLANT**. They are found attached to trees, from the decaying portions of the bark of which, or of mosses and lichens which grow upon it, they derive their nutriment, probably, also drawing it from the air to a larger extent than other plants do. Mosses and lichens themselves, growing upon trees, may be called epiphytes, but the term is generally used of phanerogamous plants. Epiphytes are not connected with the trees on which they grow in the peculiar manner of the mistletoe,

EPIPLEROSIS—EPIPOLISM.

Balanophora, and other true parasites—not sending roots like them into the wood to suck the juice of the tree. It is chiefly in warm and moist climates that phanerogamous epiphytes are found. Most of them prefer shady situations. Within the tropics, they often form an interesting and remarkable feature of the vegetation. Some of the *Bromeliaceæ* (as *Tillandsia*), *Cactaceæ*, *Araceæ*, *Gesneraceæ*, and other nat. orders are epiphytes; but the order to which they belong more than to any other is *Orchidaceæ*. Many of the epiphytous orchids, as well as other epiphytes, are remarkable for beauty; and the attention which has recently been given to their cultivation in hot-houses has been rewarded by perfect success. See ORCHIDS. Plants which usually occur as epiphytes are sometimes found growing on rocks also. Although seldom found except in moist climates, epiphytes are generally capable of enduring considerable drought, parting slowly with the moisture which they have once imbibed. EP'IPHYTES, n. plu. *fîtz*, or EPIPHYTA, n. plu. *ë-pîf-i-tâ*. EP'IPHYTIC, a. *-fîl'ik*, or EP'IPHYTICAL, a. *-î-kâl*, and EP'IPHYTAL, a. *-fî-tâl*, pertaining to; growing upon another plant.

EPIPLEROSIS, n. *ëp-î-plê-rô'sîs* [Gr. *epiplêrôsis*; *epi*, *plêrôsis*, repletion]: in *med.*, over-repletion; excessive fullness or distention, as of the arteries with blood.

EPIPLEXIS, n. *ëp-î-plêks'îs* [Gr. *epiPLEXIS*—from *epi*-*plêssô*, I chastise, I rebuke; *epi*, upon; *plêssô*, I strike]: in *rhet.*, figure by which a person seeks to convince and move by gentle upbraiding.

EPIPLOCE, n. *ë-pîp'lo-së*, or EPIP'LOCY, n. *-sî* [Gr. *epiplokê*, a plaiting together—from *epiPLEKô*, I plait together; *epi*, upon; *plekô*, I plait, I fold]: in *rhet.*, figure by which one aggravation, or striking circumstance, is added in due gradation to another; as, He not only spared his enemies, but continued them in employment; not only continued them in employment, but advanced them.

EPIPLOON, n. *ë-pîp'lô-ôn* [Gr. *epiPlôôn*, the caul—from *epi*, upon; *plein*, to sail, to swim]: the caul—a portion of the peritoneum or lining membrane of the abdomen, which covers in front, and as it were floats on, the intestines. EPIPLOIC, a. *ëp'î-plô'îk*, pertaining to the epiploon or caul.

EPIPODIA, n. plu. *ëp'î-pô'dî-ă* [Gr. *epi*, upon; *poda*, a foot]: the muscular lobes developed from the lateral and upper surfaces of the foot of some mollusks. EPIPODITE, n. *ë-pîp'ô-dî-t*, a process developed upon the basal joint of some of the limbs of certain crustacea. EPIPODIUM, n. *ëp'î-pô'dî-ûm*, a disk formed of several knobs or glands.

EPIPOGIUM, n. *ëp-î-pô'jî-ûm* [Gr. *epi*, upon; *pôgôn*, the beard, from the lip being uppermost]: in *bot.*, genus of orchids.

EPIPOLISM, n. *ë-pîp'o-lîzm* [Gr. *epipolê*, a surface]: same as FLUORESCENCE: see FLUOR. EPIP'OLIZE, v. *-lîz*, to affect or modify by the phenomena of epipolism; to change into an epipolic condition. EPIPOLIZED LIGHT, n. in *optics*, light acted on by epipolic dispersion.

EPIPTEROUS—EPISCENIUM.

EPIPTEROUS, a. *ĕ-pĭp'tēr-ūs* [Gr. *epi*, upon; *pteron*, a feather, a wing]: in *bot.*, having a wing at the top.

EPIRRHEOLOGY, n. *ĕ-pĭr'ĭ-ŏl'ŏ-jĭ* [Gr. *epirrĥōē*, a flowing on; *logos*, discourse]: that branch of natural science which treats of the effects of external agents on living plants.

EPIRUS, *ĕ-pĭr'ūs*: ancient name of a part of Greece, bounded e. by the chain of Pindus, s. by the Ambracian Gulf, w. by the Ionian Sea, and n. by Illyria and Macedonia. It formed the s. part of modern Albania, or the pasheac of Janina, a wild and mountainous region, haunt of robbers and semi-civilized tribes in all ages. The chief town was Dodona (q.v.); the chief rivers, the Acheron, Cocytus, Arachthus, and Charadrus. Anciently, it was celebrated for its cattle and its breed of Molossian dogs. Its earliest inhabitants were probably Pelasgians. In the historic period, Theopompus speaks of 14 tribes, most of whom were believed by the Greeks themselves to be not of Hellenic origin. The principal were the Chaones, Thespoti, and Molossi, the last of whom finally obtained the entire sovereignty of the country. Of the Molossian kings of E. the most distinguished was Pyrrhus, who long waged successful war against the Romans. But after this race of kings became extinct (B.C. 230-229) by the death of Ptolemy, grandson of Pyrrhus, a republican constitution was adopted, whereupon parties sprang up among them, and the neighboring Macedonians got the upper hand. On the conquest of Macedonia by the Romans (168 B.C.), the Epirots were accused of having assisted Perseus, the Macedonian king, and the most revengeful measures were put in force against them. Æmilius Paulus, the Roman general, plundered and razed to the ground the 70 towns of E., and sold into slavery 150,000 of the inhabitants. From this period, E. shared the vicissitudes of the Roman and Byzantine empires, until 1204, when one of the Comneni made himself independent. His dynasty ruled the country until 1466, when it was finally conquered by the Turks (see SCANDERBEG). E. peopled largely since the 14th c. by Albanians (see ALBANIA), formed latterly a part of the Turkish vilayet of Janina. The Berlin Congress, 1878, recommended that the s. part of E. should be ceded to Greece; and through the mediation of the Six Western Powers, the district e. of the river Artā was ceded to Greece 1881.

EPISCENIUM, n. *ĕp-ĭ-sĕn'ĭ-ŭm* [Gr. *episkēnion*—from *epi*, upon, over; *skēnē*, the scenes]: in *Gr. arch.*, a division of the scene of a Greek theatre: it sometimes consisted of three divisions made by ranges of columns one above the other; the lower was termed *scēna*, and the others *episcēnia*.

EPISCOPACY.

EPISCOPACY, n. *ĕ-pĭs kŏ-pă-sĭ* [Gr. *episkōpēō*, I oversee: mid. L. *episcopŭs*, an overseer—from Gr. *epi*, upon; *skōpēō*, I see]: church government by bishops; the order of bishops in the English and other churches. **EPISCOPAL**, a. -*pāl* [F.—L.]: pertaining to Episcopacy. **EPISCOPALIAN**, n. -*pă-lĭ-ăn*, an adherent or member of the Chh. of Eng., or of a church governed by bishops. **ADJ.** pertaining to. **EPISCOPALLY**, ad. -*lĭ*. **EPISCOPALIANISM**, n. -*lĭ-ăn-ĭzm*, the system of episcopal church government. **EPISCOPATE**, n. -*pāt*, the order of bishops; office and dignity of a bishop.

EPISCOPACY form of church government in which one order of the clergy is superior to others; viz. bishops (prelates) to ordinary pastors or presbyters (priests). It is called sometimes *diocesan episcopacy*, in distinction from that episcopacy which Congregationalists and Presbyterians also assert—the oversight of a local church or congregation by its pastor: see **BISHOP**. It is not essential to E. that there should be *archbishops*, exalted in rank or authority over other bishops. E. has actually subsisted under very various modifications; the power of bishops being more or less in extent, more or less controlled by synods of presbyters, or even—in the Prot. Episc. Church in the U. S.—by a diocesan convention of presbyters and lay delegates. The power of the bishop also is variously affected by the relations between church and state; and great differences in this respect exist between the Church of England, the Church of Sweden, and the Church of Denmark, all Episcopalian, and all connected with the state as *established* churches. See **ANGLO-CATHOLIC CHURCH**: **CHURCH OF ENGLAND**: **EPISCOPAL CHURCH**, **PROTESTANT**: **ROMAN CATHOLIC CHURCH**: **GREEK CHURCH**: **ETC.**

There is now, among biblical scholars, general agreement that the Greek words for 'bishop' and 'presbyter' in the New Testament are applied to the same church officer: the former describing his work as a superintendent; the latter, a title of reverence. Thus, the apostle Paul calls the 'presbyters' of the Ephesian Church 'bishops of the flock;' and the apostle Peter, styling himself a 'presbyter,' addresses his brother 'presbyters' as holding the office of 'bishop.' In each single church also, so far as appears, there was, as originally organized, a plurality of 'bishops.' Presbyterian and Congregational churches call their pastors or ministers 'elders' (that is presbyters) and 'bishops,' and regard them as constituting the one order in the ministry. Refusing a diocesan, they hold to a parochial episcopate; and are not known in popular language as holding to episcopacy.

The Roman Catholic Church teaches that its hierarchy of bishops, priests, and deacons, has been instituted by divine ordinance; that the bishops are the immediate successors of the apostles; that ordination confers a special grace; and that the pope or bishop of Rome, as the immediate successor of Peter and the vicar of Christ, is the head of the episcopate throughout the world, and has authority over the universal church.—The Greek or Eastern Church (like the Roman) teaches the divine origin of episcopacy, apostolic

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succession, and the conveying of grace in ordination by the imposition of hands: but calls the pope of Rome a usurper; and does not acknowledge the supreme authority of any earthly head over the bishops and the church.—The Jansenists of Holland, and the Old Catholics maintain the divine authority of episcopacy, but do not acknowledge allegiance to the pope. Their own episcopal orders were obtained through Rom Cath. hands.—In the Church of England and the Prot. Episc. Church of the U. S. two grades of opinion are held: 1. The Anglo-Catholic or ‘high church’ view declares that episcopacy is necessary to the *existence* of the church; that grace is imparted in ordination through the imposition of hands; and that the apostolic succession has been maintained. 2. The ‘low,’ or ‘broad church’ view teaches that episcopacy is necessary for the *well-being* of the church, but not to its existence; and that the episcopate was gradually and wisely formed out of the presbytery. This view was prevalent among the Protestants at the Reformation. Few then among English clergymen maintained the divine right of episcopacy. The most eminent of them acknowledged the validity of presbyterian orders; some of them had themselves been thus ordained. Many in the English Church hold this opinion still. Dean Stanley says, ‘According to the strict rule of the church, derived from these early times, there are only two orders—presbyters and deacons.’ Bishop Lightfoot says, ‘At the close of the apostolic age, the two lower orders of the three-fold ministry were firmly and widely established; but traces of the episcopate, properly so called, are few and indistinct.’ . . . ‘The episcopate was formed out of the presbyterial order by elevation; and the title, which originally was common to all, came at length to be appropriated to the chief of them.’—The Moravian Church has episcopal ordination, derived, 400 years ago, from a regularly ordained Waldensian bishop; but it acknowledges the ordination of other Christian churches, and freely receives ministers coming from them.—The Lutheran Church of Germany has only one order of ministers, with an officer called a superintendent. In Sweden the Lutherans have bishops (the validity of whose ordination is not clearly established), but maintain the equality of the ministry. In Denmark the bishops do not claim an unbroken apostolic succession.—The Reformed Episcopal Church ‘adheres to episcopacy, not as of divine right, but as a very ancient and desirable form of church polity.’ It derives its orders from Bishop Cummins, who had been consecrated in the Prot. Episc. Church.—The episcopacy of the Methodist Church in America avowedly rests on a presbyterial foundation; the first bishop having been ordained by John Wesley, who was a presbyter in the Church of England, and regarded the office which he thus originated as one of expediency and of superintendence. The Methodist bishops thus continue to be presbyters, elected by the representatives of the whole church, and accountable to them. They have no individual dioceses, but form ‘an itinerant general superintendency.’

EPISCOPAL CHURCH.

EPISCOPAL CHURCH, PROTESTANT: daughter or offshoot of the Church of England, agreeing with her in doctrine, discipline, and worship. Known during the colonial period as 'The Church of England in America,' it was organized after the attainment of independence as 'The Protestant Episcopal Church in the United States of America.'

Sir Humphrey Gilbert, in 1578, received authority to settle in any unoccupied regions of the new world, and was instructed to govern any colonies which he might form by laws agreeable to the policy of England and to the faith of the established church. In that year the communion was celebrated on the shores of Frobisher's Straits. White, governor of Raleigh's second colony, baptized his granddaughter Virginia Dare and an Indian on shipboard off Roanoke Island, N. C. Sir Thomas Hariot used the Prayer-Book among the Indians in 1585. Captain R. Weymouth sailed up the Penobscot 1605, and erected a cross near where Belfast, Me., now stands. The Rev. R. Seymour and others built a church and a fort at the mouth of the Kennebec 1607, Aug., but abandoned the place the following year. Meantime a permanent settlement was effected at Jamestown, Va., where the Rev. Robert Hunt held the first services, 1607, May, under an awning; a church was soon built, and common prayer recited every morning and evening, with two sermons on Sunday, and the communion every three months. Hunt was succeeded as chaplain by Buck and Whitaker: the latter baptized Pocahontas, and was called the Apostle of Virginia. In Md. also this church had an advantage, except during the rule of the Independents, who repealed the colonial laws of toleration, and proscribed 'popery and prelacy.'

In the northern colonies the population was hostile or indifferent to the English Church, and the English clergy were infrequent visitors, though Gov. Gorges took one with him to Massachusetts Bay 1623, and another settled at Shawmut, whence he removed to R. I. 1630, on or before the building of Boston. Two of the patentees of Salem were banished thence 1629 for using the Prayer-Book. Persons who petitioned for its use at Boston, 1646 and 1664, were treated as seditious, but in 1679 King's Chapel was erected. In New York the first services, so far as known, were held 1678, and Trinity church was built and endowed 1696. In Penn. nothing appears to have been done till 1695.

The church throve as it might without ordination or confirmation, for it was never favored with the presence of a bishop, and its ministers necessarily came from England, or went thither to be ordained. The bp. of London, who was supposed to be in charge of its interests, sent to Va. as his commissary in 1685 Dr. Blair, who held the office till 1738, and sent in 1700 Dr. Bray in the same capacity to Md. The latter procured the establishment of the important Societies for Promoting Christian Knowledge and for the Propagation of the Gospel in Foreign Parts; the latter provided some clerical stipends, and sent missionaries into the

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colonies where the church was not established. Before this work began, S. C. and N. C. had no Episcopal ministers; Va. had 40 parishes and Md. 26, but in each case but half as many clergy. In Penn. there were but 250 communicants and 700 attendants. In N. Y. the numbers were 450 and 1,200, and throughout New England 185 and 900. In Conn. a movement toward this church began in Yale College, when Dr. Cutler, the rector, and two tutors resigned their posts, and went to England for ordination 1723. One of them, Brown, died of smallpox abroad, and his fate deterred others from following his example. Cutler labored long at Boston, and Johnson at Stratford, Conn., enduring much persecution. Efforts were repeatedly made to procure a bp. for America, but in vain. Bequests were made to endow a see, and a house provided at Burlington, N. J., but the story, long believed, that Talbot, minister there, had received consecration from the nonjurors, appears to be disproved.

The Episcopal Church in America was all this time at a disadvantage as compared with the other religious bodies. They were self-propagating, while the sources of her organic life were across the sea. 'The fountain of all our misery,' said one, 'is the want of a bishop.' But bishops, as officers and too frequently pliant tools of a sometimes oppressive government, were coldly regarded by many who liked the service of the English Church. In Va. and Md., where the church was nominally prevalent, her members showed no such zeal for their faith and forms as did the New England Puritans. Lacking supervision, some of her ministers were of unworthy life, and her parishes had little relation to each other. There was practically no government, no bond of union, no coherence, and little spirit of union or zeal.

At the outbreak of hostilities most of the clergy and many of the laity were loyal to the crown, and the connection of the church with England made her very name a byword of reproach to the generality of patriots. In 1775 there were some eighty ministers n. of Md., mostly supported by the S. P. G. in London; this number was soon greatly reduced. After the war only one of ten clergy remained in Penn., and a single parish. In Va., of 164 churches but 69 remained, and 28 of 91 ministers; funds could not be provided to send Dr. Griffith to England, to be consecrated with Drs. White and Provoost.

From this depressed condition the church was rescued largely through the energy and prudence of Dr. White of Philadelphia. He published, 1782, Aug., a pamphlet, *The Case of the Episcopal Churches Considered*, in which he proposed a lay share in council and government, the equality of all parishes, and the election of 'a superior order of clergy,' who should assume, as far as might be, the functions of bishops, till these could be secured. The last suggestion was soon made needless; the others were incorporated in the constitution of the church. In 1783 he opened a correspondence with the few remaining clergy and with influential laymen in the several states, looking

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to a revival and organization of the church. After meetings at Philadelphia, New Brunswick, and New York, the first General Convention assembled at Philadelphia, 1785, Sept. In this New England and N. C. were not represented. An address to the English bishops and a 'Proposed Book' were prepared, but neither met with favor.

Meanwhile Dr. Seabury, elected in Conn., had repaired to England for consecration. The bishops there were not authorized to dispense with the oath of allegiance, which could no longer be taken by Americans: at length, 1784, Nov. 14, he was consecrated in Aberdeen by the Scottish bishops, Kilgour, Petre, and Skinner, and returning home, 1785, June, began to exercise his office. Difficulties in England being soon after removed, Drs. White and Provoost, elected in Penn. and N. Y., were consecrated at Lambeth chapel, 1787, Feb. 4, by the two archbishops and two others, the bp. of Peterboro and the bp. of Bath and Wells.

The three bishops met as an upper house in the General Convention of 1789, at which the church was fully organized on a principle of the equality of dioceses, each of which received a representation of four clerical and four lay delegates. The constitution was mainly the work of Bp. White; he and Bp. Seabury bore the chief share in the revision of the Prayer-Book, which differs from that of England (beyond the changes necessary in passing from a monarchy to a republic) in the happy omission of the Athanasian Creed, and the substitution, in large measure, of the Scottish Communion Office. Diocesan Conventions were left to manage local affairs, while the General Convention became the supreme legislative body.

In 1790 Dr. Madison was consecrated in England as bp. of Va. All later consecrations were conducted at home; but progress for some years was slow. In 1808 and 1811 but two bishops were in attendance on the General Convention. In the latter year Bps. Hobart and Griswold were consecrated, and a vexed question about land titles called forth the formal declaration that the P. E. Church was no new body, but the one formerly known as the Church of England in America. Throughout these early years Bp. White was the presiding genius. His gentle firmness, his unflinching tact, his wise toleration, his beloved and saintly character, made him to his church what Washington was to the country. He lived to consecrate 26 bps., and see his diocese grow from nearly nothing to 86 clergy and 21 congregations. His *Memoirs of the Protestant Episcopal Church* (1820; enlarged 1836) is unfaithful to history only in belittling his own services.

A few facts and figures will illustrate the varying rates of progress. N. C., which had in 1770 eighteen clergy, could muster but 11 in 1830; it has now two large dioceses. Va., which was much weaker in 1814 than in colonial days, was revived by Bp. R. C. Moore. S. C. has arisen from nine parishes in 1786 to nearly 100. Under Bp. Doane in N. J. (1832-58) the number of clergy increased from 14 to 94, and of communicants from 800 to 4,500, the

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latter since quadrupled and assigned to two dioceses. The first bishop w. of the Alleghanies was Dr. Chase, consecrated for Ohio, 1819. The first missionary bishop of the northwest, Dr. Kemper, was appointed 1835. Ill. now comprises three dioceses, Mich. and Wis. each two. Penn. has three; N. Y. five, all of good size and strength; and some of them, especially that comprising the city of New York, are marvellous for their growth in the last quarter-century—a growth now increasing even its previous rapid rate by constant accessions from other denominations. The general increase of this denomination in this century has been nearly three times that of the population. In the great cities many of the parishes are superbly and elaborately equipped with every external appliance for parochial work.

About half a century ago party spirit was rife in the Episcopal Church. Dissensions were frequent concerning ritual observances and the higher or lower theories of the church. Bishop Benjamin T. Onderdonk of N. Y., who, on charges of misconduct, was suspended from his office in 1844, was even deemed by many to have been sacrificed for opinions then considered extreme. Bishop Doane of N. J., obnoxious to some for similar reasons, was subjected to trial (1849–53), but honorably acquitted. The persecuting spirit has long since utterly ceased, and there is now probably a wider range of opinions, doctrinal and ecclesiastical, among clergy and laity, and a more unquestioning tolerance thereof, than in any other Trinitarian body. Far more stress is now laid than formerly on church architecture and decoration, music, the beautifying and popularizing of the services, and on parochial work among the destitute classes, and proportionately less stress on dogmatic distinctions. Views and practices called ‘High Church’ prevail in most dioceses; but party lines are not sharply drawn, and few would deny the liberty of thinking, whether to the advanced ritualist, the antique evangelical, or the modern liberal. This freedom and lack of insistence on theories and symbols, deplored by some as a source of weakness, is rejoiced in by more as a sign of truth and strength. ‘The roomiest church in America,’ as it has been called, allowing for varieties of temperament, emphasizing the practical side of religion, having for its root-idea education rather than conversion, and not exacting a prescribed routine of spiritual experience, may, of course, be sought by some from mixed or unworthy motives; but it aims at inclusion, considering itself not so much a communion of saints as a nursery for heaven.

The bishops in this church, though endued with high powers, have become notable for that paternal, even fraternal, spirit which gives to any exercise of power its highest warrant. See BISHOP.

In every diocese the bishop and his clergy in person, and the laity by their delegates, meet often as once a year in the Diocesan Convention, or Council. This body exercises legislative authority in its diocese, enacting canons of discipline, admitting new parishes, electing a

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bishop in case of vacancy, voting on changes in the Prayer Book if proposed by the General Convention, etc.

The supreme legislative authority for the whole church is exercised by the General Convention as representative of all the federated dioceses. It meets once in three years, and consists in two co-ordinate bodies, the House of Bishops, and the House of Clerical and Lay Deputies. For its decisions a concurrent vote in both these houses is requisite; and, on demand, the vote must be 'by dioceses and orders'; i.e. a majority, to be conclusive, must be a majority of all the dioceses as represented in convention by their *clergy*, concurring with a majority of all the dioceses as represented in convention by their *laity*.

Of more than 150 bishops, past and present, two have left this church; L. S. Ives of N. C., who went to the Church of Rome 1853, and G. D. Cummins of Ky., who started the Reformed Episcopal Church (q.v.) 1873. One bishop has been deposed on moral grounds. Five have resigned their office—all missionary bishops, and four of them in foreign fields; the fifth was afterward elected to a diocese.

During the civil war a temporary schism occurred, as in other denominations seated in both the north and the south. The southern dioceses organized themselves as the 'Church in the Confederate States,' and were not represented in the General Convention of 1862; but in that of 1865 their bishops and delegates were welcomed back, and a reunion was at once effected.

This church increasingly recognizes the need of cathedrals, not only to supply models of dignified worship, but also to stand as visible centres of administration in their respective dioceses. From the cathedral, with the bishop and his organized staff, may be sent forth in orderly lines the incentive and the guidance for all Christian work, educational and charitable. The diocese of N. Y. has now under construction, on a commanding eminence in the upper part of New York city the Cathedral of St. John the Divine, which, in grandeur, in beauty, and as a model of adaptedness to the manifold uses of a central diocesan establishment, is expected to be the noblest ecclesiastical edifice in the country.

Official reports of 1896 show the following for 1895: Clergy 4,610; candidates for orders 529; postulants 270; lay-readers 1,798; parishes and missions 6,269; baptisms 64,855 (infant 49,777, adult 11,645); confirmed 44,627; marriages 17,242; burials 34,761; communicants 619,433, an increase over last year of 23,547, or 4 per cent., and an increase of 161 per cent. since 1870; Sunday-school teachers 44,441; scholars 418,674; parish school teachers 309; scholars 10,249. Total contributions for all purposes \$13,449,926; making an average per member of \$21.72; highest average in any state, N. Y. \$46.93; lowest, S. Dak. \$5.63.

This church, through General Convention or otherwise, supports a number of educational institutions. The theological schools are: the General Theol. Seminary, New York city, established 1817; Virginia Theol. Sem., near

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Alexandria, 1823; Bexley Hall, Gambier, O., 1825; Nashotah House, Nashotah, Wis., 1841; Berkeley Divinity School, Middletown, Conn., 1854; Seabury Divinity School, Faribault, Minn., 1860; Divinity School, Philadelphia, 1862; Episc. Theol. School., Cambridge, Mass., 1867; Theol. Dept. Univ. of the South, Sewanee, Tenn., 1868; Western Theol. Sem., Chicago, Ill., 1885; Lee Hall, Davenport, Ia. Diocesan schools are at San Mateo, Cal.; Denver, Colo.; Topeka, Kan.; Geneva, N. Y. (DeLancey Divinity School); Syracuse, N. Y. (St. Andrew's Divinity School); Shanghai, China; and Tokio, Japan. Prominent among church colleges are (1895): the Univ. of the South, Sewanee, Tenn., established 1868, with 29 instructors and 296 students; Kenyon Coll., Gambier, O., 1834, with 19 instructors and 180 students; Griswold Coll., Davenport, Ia., 1859, with 26 instructors and 180 students; Hobart Coll., Geneva, N. Y., 1825, with 17 instructors and 81 students; Trinity Coll., Hartford, Conn., 1823, with 19 instructors and 130 students; and Racine Coll., Racine, Wis., 1853, with 6 instructors and 40 pupils.

A list of other institutions (1896) will give some idea of the varied activities of this Church. The Domestic and Foreign Missionary Soc. has for its members all baptized persons in the church, and is governed by a council consisting of all the bishops and numerous clergy and laymen. The Church Building Fund Commission organized 1880; the Church Society for Promoting Christianity among the Jews; the Commission for Church Work among Colored People; and the Church University Board of Regents; incorporated 1890. These, and a Fund for the Relief of Widows and Orphans of Deceased Clergymen, and of Aged, Infirm, and Disabled Clergyman, are controlled by General Convention. The American Church Missionary Soc., incorporated 1861, and the Evangelical Education Soc., 1861-69, represent the 'Low Church' party. The Soc. for the Increase of the Ministry, 1859, has its headquarters at Hartford, Conn. The N. Y. Bible and Common Prayer-Book Soc. was founded 1809; the Prot. Episc. Soc. for Promotion of Evangelical Knowledge, incorporated 1848, has its publishing house in New York. The Free and Open Church Association aims to substitute free seats for rented pews. Missions to Deaf Mutes are in New York and at Gambier, O. The Clergymen's Mutual Insurance League was incorporated 1869, the Clergymen's Retiring Fund Soc. 1874, the Soc. of St. Johnland 1870. The Church Congress (q.v.) meets annually. Other institutions of recent date are the Church Temperance Soc., the Western Church Building Soc., the Church Unity Soc., the Brotherhood of St. Andrew, (with 1,120 chapters and 12,500 members), the White Cross Soc. (1886), the Parochial Mission Soc., the Confraternity of the Blessed Sacrament, the Soc. for the Home Study of the Holy Scripture and Church History, the Guilds of the Holy Cross, of the Iron Cross, of S. Barnabas for Nurses (with branches in 16 cities and 1,300 members), and of All Souls (1873), the Church Assoc. for the Advancement of

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the Interests of Labor, Men's Help Soc., the Christian Social Union in the U. S., Knights of Temperance, and Young Crusaders, Woman's Auxillary to the Church Temperance Soc., Church Students' Missionary Assoc. (1888), the American Church League, the Church German Soc. of (1879), Soc. of King Charles the Martyr (1894), the Order of the Daughters of the King (1885), the Order of the Sisters of Bethany (1891), the Community of St. Benedict (1894), the Church Periodical Club, American Church Sunday-school Institute, and the Church Army (1896). Some of these have acquired much influence. There are also 22 Sisterhoods, which have charge of schools, hospitals, orphanages, etc., in all parts of the country; and there are 4 religious orders for men and 12 church clubs. It is evident that this church is not content with offering historic claims and an attractive service, but is endeavoring to do her share of work among all classes of the community.

A peculiarity in the distribution of the membership of the Protestant Episcopal Church in the U. S., is the centring of her strength in the large cities, 38 per cent. of the entire number being massed in 44 of the principal cities. According to states, this peculiarity is shown as follows: In Cal. nearly one-third of the total membership in the state is in San Francisco; in Colo. about one-half in Denver; in Conn. about one-third in the cities of New Haven, Hartford, Bridgeport, and Waterbury; in Del. about one-half in Wilmington; in Ga. more than one-half in the cities of Savannah, Atlanta, and Augusta; in Ala. nearly one-third in Mobile; in Ill. one-half in Chicago; in Ind. one-fifth in Indianapolis; in Ky. one-half in Louisville; in La. three-fifths in New Orleans; in Me. nearly one-third in Portland; in Md. more than two-fifths in Baltimore; in Mass. nearly one-fourth in Boston; in Mich. about one-third in Detroit; in Minn. nearly one-half in the cities of Minneapolis and St. Paul; in Mo. more than four-fifths in St. Louis; in Neb. two-fifths in Omaha; in N. J. about one-third in the cities of Jersey City, Newark, Orange, and Camden; in N. Y. considerably more than one-half in the cities of New York, Brooklyn, Buffalo, Rochester, Albany, Troy, Utica, and Syracuse; in O. more than two-fifths in the cities of Cleveland, Cincinnati, and Toledo; in Penn. three-fifths in the cities of Philadelphia and Pittsburg; in S. C. two-fifths in Charleston; in Tenn. one-third in Memphis and Nashville; in Va. one-fourth in the cities of Richmond and Norfolk; in Wis. one-fifth in Milwaukee.

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EPISCOPAL CHURCH, REFORMED: organized by members of the Prot. Episc. Church, who give substantially the following statement of the events and circumstances which, as they believe, justify their course. 1. The Protestant Reformation in England had outwardly a political origin (in the act of the king, Henry VIII., renouncing allegiance to the pope, and proclaiming himself head of the English Church), by which the work was biased and cut short. During the brief life of the young king Edward VI., the regent, or protector, being in favor of the Reformation, great progress in it was made. Under Mary the supremacy of the pope was again acknowledged. When Elizabeth became queen, wishing to harmonize her divided subjects, and hoping for reconciliation with Rome, she strove to have the liturgy framed so as to satisfy both parties. Consequently it contained contradictory elements. At a later period, when she had found her hope futile, the articles of faith adopted were decidedly Protestant. Thus it came to pass that in the Church of England two parties found support in her ritual; the one Protestant; the other having an affinity with Rome. 2. After the American revolution, when the Church of England in the colonies became the Prot. Episc. Church in the United States, the Book of Common Prayer, having been adopted without material alterations, retained its conflicting elements. 3. The Tractarian movement, which began at Oxford, 1833, was a successful endeavor to revive the principles of antiquity and Catholicity contained in the Prayer Book, in opposition to its Protestant elements. It discarded Prot. principles and taught the doctrines of apostolic succession, priestly absolution, baptismal regeneration, the real presence, and the authority of the church. 4. These teachings produced a powerful effect in the United States also. A great increase of ritualism and of the drift toward Rome was soon manifested; the opposition between the 'High' and the 'Low Church' parties was intensified, and practical measures were adopted by each which widened the chasm. 5. Several subsequent public events fanned the flame of discontent; especially the censure of one clergyman for preaching in a Methodist church, and the suspension of another for omitting the word 'regenerate' in the baptismal office. 6. Remonstrances and petitions for relief, which were numerous and urgently presented to the General Convention, produced no effect. 7. During the sessions of the Evangelical Alliance in New York 1873, Oct., Bp. Cummins, of the diocese of Kentucky, having, by invitation, officiated at a union celebration of the Lord's Supper, in company with representatives of other denominations, was for this act of Christian fellowship bitterly censured, through the press, by members of the 'High Church' party. After this, convinced that he could no longer rightfully continue in a church whose theory and practice (as interpreted by the majority of its members) denied the brotherhood of believers in Christ, Bp. Cummins withdrew from the ministry of the Prot. Episc. Church. 8. This led to the or-

EPISCOPAL SYSTEM.

ganization, 1873, Dec. 2, of the Reformed Episcopal Church, of which Bp. Cummins and the Rev. Dr. Charles E. Cheney were elected bishops. At the same time the following declaration of principles was adopted: 'I. The Reformed Episcopal Church, "holding the faith once delivered to the saints," declares its belief in the Holy Scriptures of the Old and New Testaments as the Word of God, and the sole rule of faith and practice; in the creed "commonly called the Apostles' creed;" in the divine institution of the sacraments of baptism and the Lord's Supper; and in the doctrines of grace substantially as they are set forth in the Thirty-nine Articles of Religion. II. This church recognizes and adheres to Episcopacy, not as of divine right, but as a very ancient and desirable form of church polity. III. This church, retaining a liturgy which shall not be imperative or repressive of freedom in prayer, accepts the Book of Common Prayer, as it was revised, proposed, and recommended for use by the General Convention of the Prot. Episc. Church, 1785; reserving full liberty to alter, abridge, enlarge, and amend the same as may seem most conducive to the edification of the people, "provided that the substance of the faith be kept entire." IV. This church condemns and rejects the following erroneous and strange doctrines as contrary to God's Word: 1. That the church of Christ exists only in one order or form of ecclesiastical polity. 2. That Christian ministers are "priests" in another sense than that in which all believers are "a royal priesthood." 3. That the Lord's table is an altar on which the oblation of the body and blood of Christ is offered anew to the Father. 4. That the presence of Christ in the Lord's Supper is a presence in the elements of bread and wine. 5. That regeneration is inseparably connected with baptism.' To this statement it may be added that in this church the bishops do not constitute a separate order, but are presbyters; in council they vote with and as their brother presbyters, and are subject to confirmation or appointment by the general council.

EPISCOPAL SYSTEM, in the Roman Catholic Church: theory which claims for the whole body of bishops the supreme power in the church. It was brought out strongly by the conflicting papal elections which, commencing 1378, established rival popes at Avignon and at Rome. The council of Pisa (1409) cited the rivals before them, and, on their refusal to appear, deposed them. The council of Constance (1414) finding three rival popes deposed them all. The council of Basel (1431) denied the right of the pope to dissolve it, and cited him to appear at its bar. In 1439 it declared him a heretic, and afterward deposed him. In later times the superiority of a general council over the pope continued to be maintained by the Gallican Church in opposition to ultramontaniam. But the Vatican council (1870) declared that the pope is superior to all councils; and, when speaking officially on faith and morals, is infallible. This decision has, for the present, overwhelmed the episcopal system in the Rom. Cath. Church.

EPISCOPIUS—EPISODE.

EPISCOPIUS, *ĕp-ĭs-kō'pĭ-ŭs*, **SIMON** (Dutch name, Bisschop): 1583-1643; b. Amsterdam: head of the Arminian party after the death of Arminius. He studied at Leyden, took his degree 1606, and was ordained pastor of the village of Bleyswyck near Rotterdam 1610. In the following year, the states-general, with the intention of putting an end to the agitations created by the controversies between the Gomarists or Calvinistic party and the Arminians or Remonstrants, ordered a conference to be held in their presence at the Hague between six ministers of each party. E. was one of the six charged with the advocacy of Arminianism, and highly distinguished himself by good temper, ability, and learning. In 1612, the curators of the Univ. of Leyden appointed him prof. of theology in place of Gomar, who had gone to Seeland. This enraged the leaders of the orthodox party, who unscrupulously accused E. of Socinianism, and of having entered into an alliance with the Rom. Catholics for the destruction of Protestantism. By this the fanaticism of the populace was roused; he was insulted and abused in the street, and on one occasion narrowly escaped being stoned to death. The house of his brother in Amsterdam was sacked, under the pretext that it was a rendezvous of the Remonstrants. In 1618, occurred the famous Synod of Dort (q.v.). E. was present, with several other Arminians. The Calvinists, who were in an overwhelming majority, would not allow him to speak; they told him that the synod was met not to discuss, but to judge; and all the proceedings exhibited the bigotry and tyranny to which ecclesiastical tribunals have been deemed liable. Expelled from the church, and banished from the country, E. betook himself first to Antwerp, afterward to Rouen and Paris, but 1626 returned to Rotterdam, where the *odium theologicum* against his party had become less virulent. Here he married in 1630, and four years later was made primarius prof. of divinity in the newly established college of the Remonstrants. E. held enlightened principles in regard to religious toleration. Not placing a high value on merely doctrinal views, but trusting rather to the efficacy of the Christian spirit to elevate and purify the character, and seeing, moreover, the presence of this spirit in men holding the most conflicting opinions (when not inflamed with controversial hates), he was desirous of a broader and more catholic bond of unity among Christians than the opinionative creeds of his day permitted. His chief works are his *Confessio Remonstrantium* (1621), *Apologia pro Confessione* (1629), and *Institutiones Theologicae*, incomplete. A complete ed. of his works appeared Amsterdam, 2 vols. 1650.

EPISKELETAL, a. *ĕp-ĭ-skĕl'ĕ-tal* [Gr. *epi*, upon; Eng. *skeleton*]: in *anat.*, above the embryonic vertebral axis; name given by Huxley to what Quain calls epiaxial.

EPISODE, n. *ĕp'ĭ-sōd* [F. *épisode*—from Gr. *epēi sōdōs*, a coming in besides—from *epi*, *eisōdōs*, a coming in—from *eis*, into; *hodos*, a way]: an incidental narrative or digression introduced for the purpose of giving greater variety to the

EPISTOLÆ OBSCURORUM VIRORUM.

events related. EP'ISOD'IC, a. -sōd'ik, or EP'ISOD'ICAL, a. -ī-kāl, pertaining to or contained in an episode. EP'ISOD'ICALLY, ad. -lī.

EPISPASTIC, a. ěp'ī-spās'tik [Gr. *epispastikos*—from *epi*, upon; *spaō*, I draw]: in *med.*, drawing; blistering: N. that which acts as a blister.

EPISPERM, n. ěp'ī-spērm [Gr. *epi*, upon; *sperma*, the seed]: in *bot.*, the external covering of the seed. EP'ISPORE, n. -spōr, the outer covering of some spores.

EPISTAXIS, n. ěp'ī-stāk'sis [Gr. *epi*, upon; *stazein*, to drop]: the act or state of bleeding from the nose.

EPISTERNA, n. ěp-ī-stēr'na [Gr. *epi*, upon; *sternon*, the breast; the chest]: in *zool.*, lateral pieces of the inferior or ventral arc of any somite in a crustacean.

EPISTERNAL, a. ěp'ī-stēr'nāl [Gr. *epi*, *sternon*, the breast-bone]: situated on or above the sternum or breast-bone. EPISTER'NUM, n. -nūm, the upper part of the sternum or breast-bone.

EPISTHOTONOS, n. ěp'īs-thōt'ō-nōs [Gr. *episthen*, forward; *teinō*, I bend or stretch]: in *med.*, a spasmodic affection in which the body is bent forward.

EPISTILBITE, n. ěp'ī-stil'bīt [Gr. *epi*, upon; *stīlbē*, lustre]: a crystal of a white, bluish, or yellowish-white color: see STILBITE.

EPISTLE, n. ěp'is'l [L. *epistolā*; Gr. *epistolē*, anything sent by a messenger—from *epi*, upon; *stellō*, I send: Sp. and It. *epistolā*]: a letter; a writing or communication to be sent; in the *service of some churches*, a Scripture lesson read usually from one of the Apostolic speeches, though some times from other books of Scripture; a part of the service supposed to be as old as the 6th c. EPIS'TOLARY, a. -tō-lēr-ī, pertaining to letters or correspondence; contained in letters. EPIS'TOLIC, a. ěp'īs-tōl'ic, or EPIS'TOLICAL, a. -ī-kāl, pertaining to letters or epistles. EPIS'TLER, n. -p'is'lēr, old name for the priest who reads the epistle in the Communion Service. EPISTLE SIDE OF THE ALTAR, left side of the altar or communion table (looking from it along the church), at which in the church service the epistle of the day is read. It is of less distinction than the right or gospel side, and is occupied by the clergyman of lower ecclesiastical rank.

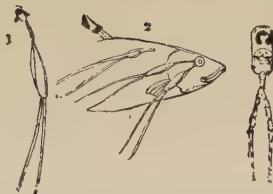
EPISTOLÆ OBSCURORUM VIRORUM, ěp'is'tō-lē ōb-skū-rō'rūm vī-rō'rūm (Lat., Letters of Obscure Men): collection of satirical letters which appeared at the commencement of the 16th c., and professed to be the composition of certain ecclesiastics and professors in Cologne and other places in Rhenish Germany. They were directed against the scholastics and monks, and lashed with merciless severity their doctrines, writings, morals, modes of speech, manner of life, follies, and extravagances, and thus helped to bring about the Reformation. The controversy of Reuchlin with the baptized Jew, Pfefferkorn, concerning Hebrew punctuation, gave the first occasion to the *Epistolæ*, and it is probable that their title itself was suggested by the *Epistolæ Clarorum Virorum ad Reuchlinum Phorcensum*



Part of **Epiphyllouspermopis**. Frond.



Episperm.—Section of Seed: *a*, The episperm; *b*, The endopleura; *c*, The endosperm.



Epizoa.—1, *Lerniacerna spratti*, and (2) Sprat infested with it; 3, *Pandaricus bicolor*.



Erased.



Ermine.



A Lion's Head Erased.



Erica herbacea.



Erato.—Antique, British Museum.



Wool-tree(*Eriodendron anfractuosum*).

EPISTOME—EPITAPH.

(1514). They were addressed to Octuin Gratius in Deventer, who was far from being so complete an *ignoramus* as might be supposed from this circumstance, but who had made himself odious to the liberal minds of the time by his arrogant pretensions and his determined hostility to the rising spirit of reform. On the first appearance of the work, it was ascribed to Reuchlin; afterward, to Reuchlin, Erasmus, and Hutten. More recent investigators have inclined to the belief, that the *first* part, which appeared at Hagenau 1515 (but professedly at Venice), was the production of Wolfgang Angst, learned and witty book-printer of that town; but, latterly, doubt has been expressed whether even he had anything to do with the *Epistolæ*. In the composition of the second part (published 1519), Erotus Rubeanus had, after Ulrich von Hutten, the most considerable share. The placing of the *Epistolæ* in the catalogue of forbidden books by a papal bull, helped to spread it. Among numerous editions of the work (1643, 1703, 1827, etc.), the best is by Böcking (1858; 2d ed. 1864). See D. F. Strauss's *Ulrich von Hutten*.

EPISTOME, n. *ěp-is'tō-mě* [Gr. *epi*, upon; *stoma*, a mouth]; a valve-like organ which arches over the mouth in certain of the polyzoa.

EPISTOMIUM, n. *ěp'ĩ-stō'mĩ-ũm* [Gr. *epistōmion*, a gag, a stopple]: the cock or spout of a water-pipe, or of any vessel containing liquids to be drawn off in small quantities when required. **EP'ISTO'MEUS**, a. -*ũs*, spigot-shaped.

EPISTROPHE, n. *ě-pĩs'trō-fě* [Gr. *epistrōphē*, a turning toward, conversion—from *epi*, upon; *strōphē*, a turning]: in *rhet.*, a figure in which each member of a sentence concludes with the same affirmation.

EPISTROPHY, n. *ě-pĩs'trō-fĩ* [Gr. *epistrōphē*, a turning about, conversion—from *epi*, upon; *strōphē*, a turning]: in *bot.*, the reversion of a monstrous or variegated form to a normal one; a mode of distribution of protoplasm and chlorophyl granules on free cell-walls under the action of light.

EPITAPH, n. *ěp'ĩ-tăf* [F. *épitaphe*—from L. *epitaphiũm*—from Gr. *epi*, upon; *taphos*, a tomb, a sepulchre]: inscription on a monument or tombstone in memory or honor of the dead. **EP'ITAPH'IC**, a. -*ĩk*, or **EP'ITAPH'IAN**, a. -*ĩ-ăn*. **EP'ITAPHIST**, n. a writer of epitaphs.—From originally signifying a monument, this word is now used exclusively to designate the commemorative inscription on a monument or tombstone. This perversion may in some measure have arisen from the remembrance of the funeral orations which the ancients were in the habit of pronouncing at funerals. But the epitaph, in its stricter sense, was well known to the classical nations of antiquity; and, indeed, by every people a brief commemoration of the heroic actions or personal virtues of their illustrious dead has been regarded as one of the worthiest occupations of the faculties of the living. As epitaphs were not only engraved on the most enduring substances, but from their brevity were easily preserved in the memory and orally transmitted, wherever we find the

EPITAPH.

literature of a people at all we are likely to discover specimens of their epitaphs. Pettigrew has translated several from Egyptian sarcophagi (Bohn's edition, p. 5), but they are of no great interest. Herodotus (vii. 228) has preserved to us those which the Amphictyons caused to be inscribed on the columns which they raised in honor of the heroes of Thermopylæ, and that which Simonides, from personal friendship, placed on the tomb of the prophet Megistias. The general inscription for the whole of them was to this effect: 'Four thousand from Peloponnesus once fought on this spot with three hundred myriads;' and that which was special to the Spartans was still more memorable: 'Stranger, go tell the Lacedæmonians that we lie here obedient to their commands.' The *Anthologia Græca*, edited by Brunk, subsequently by Jacobs, contains the largest collection of Greek epitaphs; of these many were translated and published by Bohn, 1854, under the editorial care of Mr. George Burges. Of Roman epitaphs antiquarian museums in many European countries, and in the United States, present numerous examples; for the form in which they were conceived was adopted by our own Romanized forefathers, and many a stone bearing the well-known *D. M. (Dis Manibus)*, or *Siste Viator*, probably covered the remains of those whose veins never contained a drop of Roman blood. A very interesting collection of early Christian epitaphs is in Dr. Charles Maitland's *Church in the Catacombs*, 1846. The naturally epigrammatic turn of the French mind peculiarly adapts it for this species of composition, and in French collections, such as the *Recueil d'Épigraphes*, very felicitous examples are found both in Latin and in French. Of the former may be mentioned the 'Tandem felix!' which the Count de Tenia, who had enjoyed every form of temporal prosperity, caused to be engraved on his tomb; and of the latter, the touching epitaph to a mother, 'La première au rendez-vous.' A large portion of the earlier monuments, and consequently of the epitaphs of Britain, were destroyed at the Reformation, and subsequently by the iconoclastic rage of the Puritans and Presbyterians. But at a later date, no literature, ancient or modern, vies with that of England in this peculiar branch, for while English epitaphs possess the point and tenderness without which no epitaph can be successful, they exhibit a feature almost unknown in those of other nations—that, viz., of wit, or perhaps more properly, of humor. It seems as if the English had found it impossible to confine their raillery to the living, and that it had overflowed upon the tombstones in recalling the harmless peculiarities of the dead. There are many excellent old collections of epitaphs, such as the *Thesaurus Epitaphiorum* of Philip Labbe, Paris 1666. Of modern ones, the best is that of Pettigrew, published by Bohn, arranged to mark the diversity of taste prevailing at different periods of our history. See also the works of Gruter, Græsius, Reinesius, Muratori, Mazochius; the *Monumenta Anglicana*, London 1719; Weever's *Ancient Funeral Monuments*, etc.

EPITASIS—EPITHELIOMA.

EPITASIS, n. ěp'it'a-sis [Gr. a stretching—from *epi*, upon, over; *teinō*, I stretch]: in *anc. drama*, that part of a play in which the plot thickens; the part which embraces the main action of the play; opposed to *protasis* (q. v.).

EPITHALAMIUM, n. ěp'ĩ-thũ-lũ-mĩ-ũm [L.—from Gr. *epithālamion*, that which appertains to the bridal-chamber, the bridal song—from *epi*, upon; *thalāmos*, a bed-room: F. *épithalame*]: nuptial song in honor of the bride and bridegroom. The Greeks and Romans sang such a poem in chorus near the bridal-chamber (*thalamus*) of a newly married pair. Anacreon, Stesichorus, and Pindar composed poems of this kind, but only scanty fragments have been preserved. The E. of Peleus and Thetis by Catullus is one of the finest specimens of Latin poetry extant; but probably the most gorgeous E. in all literature, is that of the English poet Spenser. A collection of Greek and Latin epithalamia is in Wernsdorf's *Poetæ Latini Minores* (IV. part 2).

EPITHECA, n. ěp'ĩ-thē'kǎ [Gr. *epi*, upon; *thēkē*, a sheath, a box]: a continuous layer surrounding the thecæ in some corals externally. **EPITHECIUM**, n. ěp'ĩ-thē'si-ũm, the surface of the fructifying disk in certain fungi and lichens.

EPITHELIOMA, n. ěp'ĩ-thē'li-ō'mǎ [formed from *epithelium*, which see]: epithelial cancer, occurring on tegumentary or mucous surfaces, the lips and cheeks being the parts most commonly affected by it: see **EPITHELIUM**: **CANCER**.

EPITHELIUM.

EPITHELIUM, n. *ĕp-i-thĕ-lĭ-ŭm* [Gr. *epi*, upon; *thĕlē*, the nipple, or *thallō*, I grow]: in *anatomy*, layer of cells forming the surface of all the internal membranes of the body; in *plants*, a finer epidermis having extremely fine cells filled with colorless fluid, and lining the ovary, etc. **EP'ITHE'LIAL**, a. -*āl*, pertaining to or formed of. **EPITHELIATED**, a *ĕp-i-thĕ-lĭ-ā-tĕd*, covered with a very delicate lining, as a serous cavity, a membrane, etc.—*Epithelium* in anatomy is the cell-tissue which, in layers of various thickness, invests not only the outer surface of the body, and the mucous membranes connected with it—as, for example, those of the nose, lungs, intestinal canal, etc.—but also the closed cavities of the body, such as the great serous membranes, the ventricles of the brain, the synovial membranes of joints, the interior of the heart and of the blood-vessels proceeding to and from it, the ducts of glands, etc.

The thickness of this tissue varies extremely with the position in which it occurs. In some parts it consists of numerous strata of cells, collectively forming a layer of more than a line in thickness; in other parts, it is composed of only a few strata, or often of only a single stratum of cells, and can be detected only by the microscope.



Fig. 1.

Epidermis (still soft like the epithelium of internal parts) of a two months' human embryo. Mag. 350 diam.

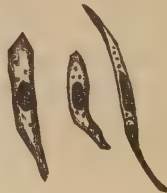


Fig. 2.

Epithelial cells of the vessels; the longer one from the arteries, the shorter ones from the veins.

The cells of which the epithelium is composed are usually soft nucleated cells; they may be rounded, polygonal, fusiform, cylindrical, or conical in shape, and sometimes they possess vibratile cilia, the appearance and uses of which are explained below. See **CILIA**.

(a) *Epithelium in a single stratum* may be composed of—



Fig. 3.

Epithelium of the intestinal villi of the rabbit. Mag. 300. diam.

Kölliker, in his *Manual of Human Histology*, adopts the following arrangement. He considers (a) epithelium in a single stratum, and (b) epithelium in many layers.

EPITHELIUM.

1. *Rounded, polygonal cells*, constituting the variety known as pavement or tessellated epithelium, and occurring as an investment of the serous membranes, of most synovial membranes, of the lining membrane of the heart and of the veins, of the canals of glands, etc.

2. *Fusiform, superficially united cells* (fusiform epithelium), as the epithelium of the arteries and of many veins.

3. *Cylindrical cells* (cylinder epithelium), as in the intestine from the stomach to the termination of the alimentary canal, in the excretory ducts of all the glands opening into the intestine, etc. For illustrations of this cylinder epithelium, see DIGESTION, ORGANS AND PROCESS OF.



Fig. 4.
Ciliated cells from
the finer bronchial
tubes. Mag. 350
diam.

4. *Cylindrical or conical ciliated cells*, as the epithelium of the more minute bronchial tubes, of the nasal cavities, and of the uterus.

5. *Rounded ciliated cells*, as the ciliated pavement epithelium of the ventricles of the brain in the fetus.

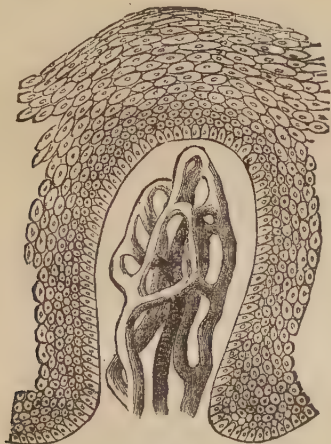


Fig. 5.

Laminated pavement epithelium investing a simple papilla (with blood-vessels in the interior) from the gums of a child. Mag. 250 diam.

(b) *Epithelium in many layers* may be composed of:

1. *Cylindrical or rounded cells below, and more or less flattened cells above.* This is termed laminated pavement epithelium, and occurs in the mouth, lower part of pharynx, œsophagus, bladder, etc.

2. *Rounded cells below, more elongated ones in the middle, and ciliated conical ones above.* This is termed laminated ciliary epithelium, and occurs in the larynx, trachea, and larger bronchial tubes, in the greater part of the nasal cavity, etc.

EPITHELIUM.

In all the varieties of epithelium, the layer of external cells is being constantly disintegrated and replaced by the layer immediately beneath.



Fig. 6.

Ciliated epithelium from the trachea of a man. Mag. 350 diam. *a*, outermost part of the elastic longitudinal fibres; *b*, homogeneous outermost layer of the mucous membrane; *c*, deepest round cells; *d*, median long cells; *e*, outermost conical ciliated cells.

The uses of the chief varieties of epithelium, especially of ciliated epithelium, are as follows:

The polygonal or pavement of epithelium mainly acts like the epidermis, as a protecting medium to the soft parts beneath.

The cylindrical epithelium additionally takes an active part in the process of secretion. For illustrations of the function of the cells forming this variety of epithelium, see CELLS, ANIMAL; DIGESTION, ORGANS AND PROCESS OF: further see SECRETION.

In connection with ciliated epithelium, *ciliary motion* generally, so far as it occurs in the animal kingdom, is to be noticed. Certain surfaces which are lubricated by a fluid, are covered with a multitude of hair-like processes of extreme delicacy and minuteness (their length varying from $\frac{1}{1000}$ to $\frac{1}{12000}$ of an inch), which from their shape are termed *cilia*, from *cilium*, an eyelash (see CILIA). During life, and for a certain period after death, these filaments exhibit a remarkable movement, each cilium bending rapidly in one direction, and rapidly returning to its original position (according to Krause, these movements range from 190 to 230 in a minute). On examining a ciliated surface with a high magnifying power, the motion presents an appearance somewhat resembling that of a cornfield agitated by a steady breeze. Any minute objects coming in contact with the free extremities of the cilia are urged onward in the direction of the predominant movement; and the best method of observing the course of the ciliary current is to sprinkle the surface with a little powdered charcoal, grains of which may speedily be seen to move onward in a definite direction.

An easy way to observe this phenomenon is to detach, by scraping with a knife, a small piece of epithelium from the back of the throat of a living frog. The scales, moistened with water or serum, will continue to exhibit the

EPITHELIUM.

movement of their adherent cilia for a considerable time, provided the piece be kept duly moistened. On one occasion, a piece prepared in this way by Mr. Bowman and Dr. Todd exhibited motion for 17 hours; and it would probably have continued longer, had not the moisture around it evaporated; and if the epithelium is not removed from the body of an animal that has been killed, the motion continues much longer. In a turtle, after death by decapitation, it lasted, in the mouth, 9 days; in the trachea and lungs, 13 days; and in the œsophagus, 16 days. In man and mammals, it seldom lasts two days, and usually ceases much sooner. The necessary condition for their movement appears to be the integrity of the cells to which they are attached; for as soon as these shrink up for want of moisture, or undergo any physical change, the cilia cease their characteristic action. We know nothing regarding the mechanism or source of ciliary motion, except that (as it continues on detached epithelium) it is independent of both the vascular and nervous systems.

This phenomenon exists very widely throughout the animal kingdom. Dr. Sharpey, in his article *CILIA* (published more than 40 years ago, *Cyclopædia of Anatomy and Physiology*) notices its occurrence in the Infusoria, in Polyps and their ova, in Acalephæ, Actiniæ, Echinodermata, Annelida, Molluska, and the Molluscoids (e.g., Ascidians), in Reptiles, Birds and Mammals. Since the date of that article, it has been discovered in Sponges, and in one or two exceptional cases in Fishes; but it has never been found in any part of the body of Articulata (Crustaceans, Insects, or Arachnids). The parts on which it occurs are (1), the skin or surface of the body, (2) the respiratory, (3) the alimentary, and (4) the genito-urinary systems; and it has been observed in the ova of numerous classes of animals, from Reptiles downward to Infusoria. In most of the parts in which we observe it, its use appears to be of a mechanical nature—viz., to convey the fluids or other matters along the surfaces on which the cilia exist, or, as in the Infusoria, to carry the entire animal through the water.

1. Cilia have been found on the external surface in Batrachian larvæ, in Mollusca, Annelida, Echinodermata, Actiniæ, Medusæ, Polypi, and Infusoria. In most cases, their function is respiratory, but in many instances it is also locomotive or prehensile.

2. Ciliary motion has been observed on the lining membrane of the air-passages of Mammals, Birds, and Reptiles, where, whatever may be its other uses, it serves to convey the secretions along the membranes, together with any foreign matter that may be present. It exists also on the external gills of Batrachian larvæ, and on the respiratory organs of Molluska and Annelida. The cilia which exist externally on still lower animals without separate respiratory organs, assist in the respiratory process, by renewing the water on the surface.

3. It occurs in the mouth, throat, and gullet of various reptiles, and in the alimentary canal of the Mollusca, Echinodermata, many Annelida, and Acalephæ. It is not

EPITHEM—EPITROCHOID.

easy, as Dr. Sharpey observes, to see the purpose of the motion in all these cases. In some, it may merely convey secreted matters along the surface of the lining membrane; and in others it seems to serve in place of ordinary deglutition, to carry food into the stomach.

4. It is observed on the surface of the reproductive organs of Mammals, Birds, and Reptiles. From the direction of the current being from without inward, the office of the cilia may be to hurry down the ovum, in addition to removing the mucous secretion of the membrane.

In Reptiles and Fishes, ciliary motion exists at the neck of each uriniferous tube. The movement is directed toward the tube, and favors the flow of the watery portion of the secretion toward it.

There are some situations, both in man and the lower animals, in which it is difficult to determine what functions the ciliary motion can perform, as, for example, in man, in the ventricles of the brain; and in the frog, in the closed cavities of the pericardium and peritoneum.

EPITHEM, n. *ěp'î-thēm* [Gr. *epithēmā*, that which is laid upon a thing—from *epi*, upon; *tithēmī*, I place]: in *med*, a liquid in which cloths may be dipped to be laid on any part of the body; a poultice.

EPITHET, n. *ěp'î-thēt* [L. *epithēton*, an epithet—from Gr. *epithētōs*, added or put to, annexed—from *epi*, upon; *tithēmī*, I place]: a word which expresses some real quality of the thing to which it is applied. **EP'ITHETIC**, a. *-īk*, pertaining to; abounding with epithets—**SYN.** of 'epithet': title; appellation; adjective.

EPITITHIDES, n. *ěp'î-tith'î-dēz* [Gr. *epitithēmī*, I place upon, I add; *epi*, upon; *tithēmī*, I place]: in *arch.*, the upper members of the corona surmounting the fastigium of a temple, which was also continued along the flanks.

EPITOME, n. *ě-pit'ō-mě* [Gr. *epitōmē*, a surface-incision, an abridgment—from *epi*, upon; *temnō*, I cut; *tōmē*, a cutting]: a brief summary or abridgment of any book or writing; an abstract or compendium. **EPIT'OMIZE**, v. *-mīz*, to reduce a work to a small compass; to shorten or abridge by giving the principal matter. **EPIT'OMIZING**, imp. **EPIT'OMIZED**, pp. *-mīzd*. **EPIT'OMIST**, n. *-mīst*, one who; also **EPIT'OMIZER**, n.—**SYN.** of 'epitome': abridgment; compend; synopsis; digest; summary; draft.

EPITRITE, n. *ěp'î-trīt* [Gr. *epitritos*, containing an integer and a third, $1 + \frac{1}{3}$ or $\frac{4}{3}$; *epi*, upon; *tritos*, the third]: in *pros.*, a foot consisting of three long syllables and a short one, and denominated first, second, third, or fourth epitrite, according as the short syllable is the first, second, third, or fourth in position, as *sālūtāntēs*, *cōncītātī*, *intērcālāns*, *incāntārē*.

EPITROCHOID, n. *ěp'î-trōk'oyd* [Gr. *epitrochos*, running easily, easily inclined; *epi*, upon; *trochos*, a runner, ball, wheel, or hoop; *eidos*, resemblance]: in *geom.*, curve formed by one circle revolving like a wheel or hoop around the convexity or outer side of the circumference of another

EPITROPE--EPIZOON.

circle. It is akin to the epicycloid, but differs in not having the generating points in the circumference of the revolving circle.

EPITROPE, n. ě-pít-ro-pě, or **EPIT'ROPY**, n. -př [Gr. *epitropē*, a yielding, a surrender; *epitrepō*, I turn over to another; I yield; I submit; *epi*, over; *trepō*, I turn]: in *rhet.*, concession; figure of speech by which any point is yielded or granted, with a view to obtain an advantage.

EPIZEUXIS, n. ěp-ĭ-zūks'is [Gr. *epizeugnumi*, to fasten on or together; *epi*, upon; *zeugnumi*, to join]: in *rhet.*, figure of speech by which a word is repeated with vehemence or emphasis: as,

"Alone, alone, all, all, alone,
Alone on a wide, wide sea."

COLERIDGE: *Ancient Mariner*.

EPIZOON, n. ěp'ĭ-zō'ōn, **EPIZOA**, n. plu. ěp'ĭ-zō'ă [Gr. *epi*, upon; *zōōn*, an animal]: parasitic animal which fastens itself on the exterior of other animals and lives upon them—opposed to *entozoon* (q.v.). Noticing those only that infest man, we may divide them into two groups: (1) Those which live upon the surface of the skin, and (2) those which live in the skin. Fleas, lice, bugs, ticks, etc., belong to the first group; the Itch-insect or *Sarcoptes*, the Pimple-mite or *Demodex folliculorum*, and possibly some other species of the *Acaridæ*, to the second.

In a zoological point of view, all the E. that infest the human subject are Insects or Arachnidans. The parasitic insects are: I. *Pulicida*, or *Fleas*, including—1. The Common Flea, or *Pulex irritans*; 2. The Sand-flea, or *Pulex penetrans*, known also as the Chigo, Chigger, etc. II. *Acanthida*, or *Soft Bugs*, including the common Bed Bug, or *Acanthia* (s. *Cimex*) *lectularia*. III. *Pediculida*, or *Lice*, including—1. The Common Louse, or *Pediculus capitis*; 2. The Body Louse, or *Pediculus vestimenti*; 3. The Crab Louse, or *Pediculus* (s. *Phthirus*) *pubis*; 4. The Louse occurring in Phthiriasis, or *Pediculus tabescentium*.

The parasitic Arachnidans belong to the order of *Acarida* or Mites; indeed, most of the animals forming the different families of this order lead a parasitic existence. We have— I. *Demodicida*, including the Pimple-mite or *Demodex* (s. *Acarus*) *folliculorum* (the dog and sheep possess each a special demodex). II. *Sarcoptida*, including the Itch-mite, or *Sarcoptes* (s. *Acarus*) *Scabiei*. (Most of our domestic animals seem to be infested by a special sarcoptes, the species of which are numerous) III. *Ixodida*, or Ticks, including— 1. The American Tick, or *Ixodes hominis* (common in Brazil); 2. The Common Wood-tick (Dogs' Tick), or *Ixodes ricinus*. There are probably many species of *Ixodes* which are occasionally found on man. IV. *Gamasida*, or Beetle Lice, including—1. The Bird-mite, or *Dermanyssus avium* (occasionally found on sickly persons); 2. The Miana Bug, or *Argas persicus* (common in some parts of Persia, especially at Miana); 3. The Chinch Bug, or *Argas chinche* (occurring in Columbia). V. *Oribatida*, or Grass-lice, including the Harvest-Bug, or *Leptus autumnalis*. See BUG: FLEA: ITCH-

EPPLICATE—EPPING.

MITE: LOUSE: TICKS. EP'IZOOT'IC, a. -zō-ōt'ik, applied to diseases prevailing among animals at the same time, over considerable tracts of country, corresponding to *epidemic* diseases among men. Like epidemics, such diseases appear to depend upon some peculiar and not well ascertained atmospheric causes; where the cases are neglected or overcrowded, they also frequently become contagious; they are apt to take on a low type of fever, and are better treated by supporting than by reducing remedies. Influenza in horses, and pleuropneumonia and vesicular epizootic in cattle, are examples: see **CATTLE-PLAGUE**: also the references there given. EPIZOOTY, n. ěp'ī-zō-ōt-ī, the distemper among horses.

EPPLICATE, n. ěp'li-kāt [L. *e*, out, here same as not; *plicatus*, folded, pp. of *plico*, I fold]: in *bot.*, not plaited.

EPOCH, n. ěp'ōk, or **EPOCHA**, n. ěp'ō-kā [mid. L. *epōchā*—from Gr. *epōchē*, a check, a pause in the reckoning of time—from *epi*, upon; *ēchō*, I hold or have: F. *époque*]: in *chronology*, fixed point of time from which succeeding years are numbered (see **CHRONOLOGY**); period in the progress of events when some important occurrence takes place; a fixed and important period of novelty or change; in *geol.*, age or era (see **ERA**); in *astron.*, an abbreviation for 'longitude at the epoch:' it means the mean heliocentric longitude of a planet in its orbit at any given time—the beginning of a century, for instance. The epoch of a planet for a particular year is its mean longitude at mean noon, Jan. 1, when it is leap year, and Dec. 31 of the preceding year, when it is a common year. The epoch is one of the elements of a planet's orbit.—**SYN.** of 'epoch:' date; period; era; time; age; generation.

EPODE, n. ěp'ōd [OF. *epode*—from Gr. *epōdōs*, an after-song—from *epi*, upon; *āidō*, I sing]: the third or last part of an ode. It was the last part of the chorus of the ancient Greeks, which they sang after the strophe and antistrophe, when the singers had returned to their original place: it had its peculiar measure of syllables and number of verses: see **CHORUS**. **EPODIC**, a. ěp'ōd'ik, pertaining to.

EPONYM, n. ěp'ō-nīm [Gr. *epōnīmā*, a surname—from *epi*, upon; *onīmā*, a name]: the individual who is assumed as the person from whom any race or tribe took its name. **EPONYMOUS**, a. ěp'm'ī-mūs, giving one's name to a people, a country, and suchlike; also **EPONYMIC**, a. ěp'ō-nīm'ik, in same sense. **EPON'YMY**, n. -ī-mī, the science or study of eponyms.

EPOPEE, n. ěp'ō-pē [F. *épopée*—from Gr. *epōpoiā*, epic poetry, the writing of it—from *ēpōs*, discourse; *poiō*, I make]: the history or fable which makes the subject of an epic poem.

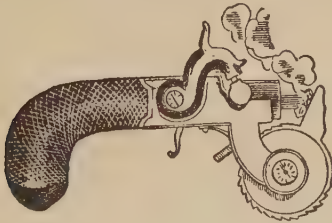
EPOS, n. ěp'ōs [Gr. *epos*, a word, a tale]: an epic poem; the subject or story of an epic poem; eposée.

EPPING, ěp'ing: town in the w. of Essex co., England, in a pleasant healthful situation, at the n. end of Epping Forest, 16 m. n.n.e. of London. It has a very irregular appearance. It is noted for its cream, butter, sausages, and

ÉPROUVETTE.

pork, and sends much butter to London. Epping Royal Forest, formerly Waltham Forest, where the ancient kings enjoyed much sport, covered all Essex, and extended almost to London. It is now limited to 60,000 acres in the s.w. part of the county. Of this tract, only 12,000 acres are in wastes and woods, the rest being now inclosed as private property. At the cost of about half a million of pounds, 5,600 acres of E. Forest were secured by the corporation of London, and declared free to the public by the queen, 1882, May. These ten sq. m. of almost unbroken woodland form one of the most extensive and beautiful pleasure-grounds in Europe. In the forest is Queen Elizabeth's hunting-lodge. Separated by a stream from E. Forest is Hainault Forest, lately disforested.—Pop. of E. abt. 3,000.

ÉPROUVETTE, n. *à'prô-vèt'* [F.]: a gun, machine, or contrivance of any kind for proving or testing the strength of gunpowder, invented or suggested in the last c. by Robins, and greatly improved by Dr. Hutton.—The *gun* E. determines the strength of gunpowder by the amount of recoil.



Épreuve.

A small gun, usually a 'half-pounder,' is fixed to the lower end of an iron rod; its base being adjusted to an arm projecting from the rod; or it is suspended from an iron frame. A horizontal steel axis is fixed to the rod or frame about which the gun may vibrate. A pointed iron rod or style projects downward from the lower side of the gun, and touches a groove filled with soft wax; the groove is so shaped that, when the gun recoils, the point cuts a path for itself along this wax; and the length of this path determines the amount of recoil. Sometimes a brass graduated arc with an index is used instead of the pointed style and the waxed groove; but the principle of action is the same. On the arc the recoil should vary from 26° for new fine-grain powder to $20^{\circ} 5'$ for old powder of coarse grain. This system of proof is resorted to annually for the proof of powder in store, to ascertain the amount of deterioration.—The *mortar* E. determines the strength of gunpowder by the distance to which a ball is projected. It is generally a mortar of 8-inch bore, in which 2 to 4 ounces of powder is employed to propel an accurately turned iron shot about 120 yards. Other things being equal, the strongest gunpowder sends the shot to the greatest distance; and this is a usual mode in testing gunpowder supplied from contractors.

The ordinary E. is shaped like a small pistol without a

EPSOM—EPWORTH.

barrel, and having its breach chamber closed by a flat plate connected with a strong spring. On the explosion of the powder against the plate, it is driven back to a distance indexed according to the strength of the powder, and is retained at its extreme state of repulsion by a ratchet wheel.

EPSOM, *ĕp'som* (said to have originally been Ebbasham): small market-town on the margin of the Banstead Downs in Surrey, England, 15 m. s.s.w. of London by road, 14 m. by the London and S.-Western railway. The famed sulphate of magnesia springs of E. gave their name to the Epsom Salts formerly manufactured from them. This manufacture has been abandoned from the ease with which these salts can be made artificially from magnesian limestone, or from sea-water. The Royal Medical College, on the Downs, established 1851, provides education for about 170 boys, sons of medical men, and affords a home to decayed members of the profession and their widows. On the Downs, $1\frac{1}{2}$ m. s. of the town, the famous E. horse-races are held yearly; said to have been instituted by Charles I., but of greater importance since the institution of the Derby Stakes 1780 (see DERBY DAY). The races last four days, and as many as 100,000 persons often assemble to witness the most important of them.—Pop. (1881) 6,916 ; (1891) 8,417.

EP'SOM SALT, or EPSOMITE, or SUL'PHATE OF MAGNESIA ($MgO + SO_3HO$): mineral occurring in the water of mineral springs, as at Epsom, Seidlitz, and many other places; also as an efflorescence on various rocks, sometimes with alum, as at Hurlet, in Renfrewshire; and on the ground, as in some parts of Spain and of the Russian steppes. It is sometimes snow-white and very pure, sometimes discolored by impurities; and is either in fine thread-like crystals, or in crusts, flakes, granules, etc. Its crystals are prisms, almost rectangular. For purposes of commerce, it is now obtained by the action of dilute sulphuric acid upon magnesian limestone: see MAGNESIUM.

E. S. is a well-known purgative in household medicine. It may be given in doses from two drachms to one ounce, according to the effect required, in a tumbler of water.

EPULIS, n. *ĕp'ū-līs* or *ĕ-pū'līs* [Gr. *epi*, upon; *oulon*, gum]: a tumor of the gum, often connected with a carious tooth.

EPULOTIC, a. *ĕp-u-lōt'ik* [Gr. *epoulōtikos*—from *epouloō*, to scar over; *epi*, over; *oulē*, a wound healed over; a scar; *oulos*, whole, sound]: tending to heal or cicatrize; cicatrizing: N. a preparation which has the property of healing, drying, or cicatrizing wounds.

EPURÆA, n. *ĕp-ūr-ē'a* [Gr. *epouraios*, on the tail; *epi*, upon; *oura*, tail]: in *entom.*, genus of beetles, family *Nitidulide*.

EPWORTH, *ĕp'wërth*: town in the n.w. of Lincolnshire, England, 30 m. n.n.w. of Lincoln. It consists chiefly of one street, more than 2 m. long. The chief employments are hemp and flax dressing, rope-making, and malting.

EPWORTH LEAGUE—EQUANIMITY.

John Wesley, founder of Methodism, as well as Kilham, founder of the seceding Wesleyans, was born here. Pop. 3,000.

EPWORTH LEAGUE: assoc. of young people connected with the Meth. Episc. Church, organized 1889, May, by forming a union of the various young people's societies of the church then in existence, and named after the birthplace of John Wesley. Its objects are to promote piety among the young members and friends of the church, to aid them in religious development, and to train them practically in works of mercy and help; and this is accomplished by means of the weekly prayer-meeting and the 'intellectual' and 'mercy and help' departments. It is sustained by voluntary offerings, has a weekly organ, the *Epworth Herald*, published in Chicago, Ill., and 1896 had 16,000 chapters or societies, and 1,100,000 members. The Meth. Episc. Church, S., has organized 2,000 chapters; German Methodist 500 chapters; the Scandinavian and Danish 300 chapters and there are 150 chapters in India, 36 in China and Japan, and 30 in Mexico. A Canadian League has recently been organized, and there is also a Junior League with 250,000 members. In 1895 the League raised \$50,000 for the missions of the church, and about 100,000 members joined the church through this organization.

EPYORNIS: see *ÆPYORNIS*.

EQUABLE, a. *ĕk'wǎ-bl* [L. *æquābilis*, that may be made equal—from *æquus*, equal: It. *equabile*]: smooth and uniform; even; steady; unruffled. **EQ'UABLY**, ad. *-blī*. **EQ'UABILITY**, n. *-bil'ī-tī*, continued equality; equality in motion; uniformity; evenness; also **EQ'UABLENESS**, n. *-bl-nēs*. **EQUABLE MOTION**, that by which equal spaces are passed over in equal times. **EQUAL**, a. *ĕ'kwōl* [L. *æquālis*, equal]: being of the same magnitude or extent; having the same value; possessed of the same qualities or condition; having the same benefits; in just proportion; not varying, as temper; adequate to: N. one not inferior or superior to another; one of the same age, rank, fortune, etc.: V. to make or to be of the same kind, rank, quality, etc., as another; to answer in full proportion. **EQ'UALLING** or **EQ'UALING**, imp. **EQ'UALLED** or **EQ'UALED**, pp. *-kwōld*. **EQ'UALLY**, ad. *-lī*. **EQUALITY**, n. *ĕ-kwōl'ī-tī*, similarity or likeness in regard to two things compared; the same condition or dignity; uniformity; evenness (see **LIBERTY**, **EQUALITY**, **FRATERNITY**). **EQ'UALIZE**, v. *-īz*, to make equal. **EQ'UALIZING**, imp. **EQ'UALIZED**, pp. *-īzd*. **EQ'UALIZER**, n. *-zēr*, one who. **EQ'UALIZA'TION**, n. *-ī-zā'shūn*, the act of making equal; the state of being equalized. **EQUALNESS**, n. *-nēs*, state of being equal; evenness.—**SYN.** of 'equal, a.' equable; uniform; even; level; proportionate; adequate; fair; just; commensurate; equitable; like; alike; plain; fit; balanced; unbiased.

EQUAL, EQUALIZE: see under **EQUABLE**.

EQUANIMITY, n. *ĕ'kwō-nīm'ī-tī* [L. *æquānim'itas*, calmness—from *æquus*, equal; *animus*, mind: It. *equanimita*]: evenness of mind; uniformity and steadiness of temper.

EQUATION.

EQUATION, n. *ĕ-kwā' shūn* [F. *équation*—from L. *æquā-tiōnem*, equal distribution—from *æquus*, equal—akin to Skr. *ekas*, one]: a making equal; in *alg.*, a proposition asserting the equality of two quantities, having the sign = (equal to) placed between them. **EQUATE**, v. *ĕ-kwāt'*, to reduce to an equation; to reduce to mean time or motion. **EQUA'TED**, a. reduced or corrected, as an astronomical observation. **ANNUAL EQUATION**, one of the most conspicuous of the subordinate fluctuations in the moon's motion, due to the action of the sun, which increases with its proximity to the earth and her satellite. It consists in an alternate increase and decrease in her longitude, corresponding with the earth's situation in its annual orbit, i.e., to its angular distance from the perihelion, therefore having a year instead of a month, or aliquot part of a month, for its period. For explanation of the mode of its production, see Herschel's *Outlines of Astronomy*, art. 738 *et seq.* **DIFFERENTIAL EQUATION**, equation involving differential coefficients (see

CALCULUS); such is $\frac{d^3y}{dx^3} + a \frac{dy}{dx} = x$; from which it is required to find the relation between y and x . The theory of the solution of such equations is an extension of the integral calculus, and is a branch of study of the highest importance. **FUNCTIONAL EQUATION**: see **FUNCTIONS**.—**LUNAR EQUATION**: see **LUNAR THEORY**.—**EQUA'TION OF E'QUINOXES**, difference between the true position of the equinoxes, and the position calculated on the supposition that their motion is uniform: see **PRECESSION**. **EQUATOR**, n. *ĕ-kwā'tér*, or **TERRESTRIAL EQUATOR**, the supposed or imaginary great circle which passes round the middle of the earth's surface at an equal distance from both poles, and which divides the earth into north and south hemispheres. **CELESTIAL EQUATOR**, the great circle in the sky, corresponding to the extension of the equator of the earth. **EQUATORIAL**, a. *ĕ'kwā-tō'rĭ-āl*, pertaining to the equator or regions about it: **N.** an astronomical telescope. **E'QUATO'RIALLY**, ad. *-lĭ*. **EQUATORIAL CURRENT**, the great ocean-current which manifests itself within the equatorial regions of the Atlantic, Pacific, and Indian oceans, having a decided western flow, and warmer by several degrees than the adjacent waters.

EQUA'TION: an algebraical sentence stating the equality of two algebraical expressions, or of an algebraical expression to zero. From another point of view, **E.** is the algebraical expression of the conditions which connect known and unknown quantities. Thus (1), $xy = 24$, and (2), $x^2 + y^2 = 52$, are two equations expressing the relations between the unknown quantities x and y and known quantities. Generally, equations are formed from observations from which an object of inquiry may be inferred, but which do not directly touch the object. Thus, suppose we wish to ascertain the lengths of the sides of a rectangular board which we have no means of measuring, and that all the information that we can get respecting it is, that it covers 24 sq. ft., and that the square on its diagonal is 52 sq. ft. From these facts, we can form equations from which we may determine the lengths of the sides. In the first place,

EQUATION.

we know that its area is equal to the product of its sides, and if we call these x and y , we have $xy = 24$, the first of the equations above given. Again, we know that the sum of the squares on the sides is equal to the square on the diagonal; hence, we have the second equation, $x^2 + y^2 = 52$. From these two equations, we should be able to determine the values of x and y . The determination of these values is called the *solution* of the equations.

Equations are of several kinds. A simple E. contains the unknown quantity in the first degree; e.g., $\frac{x}{2} + 3 = 4$. A quadratic E. contains the unknown quantity in the second degree; e.g., $x^2 + 5x - 36 = 0$. Cubic and bi-quadratic equations involve the unknown in the third and fourth powers respectively. For the higher equations there are no special names; they are said to be equations of the degree indicated by the highest power of the unknown which they contain. Simultaneous equations involve two or more unknown quantities, and there must always be as many of them, in order to their determinate solution, as there are unknown quantities. The equations first mentioned—viz., $xy = 24$, $x^2 + y^2 = 52$ —are simultaneous equations. It may be mentioned that in the course of solving such equations the principal difficulties encountered are always ultimately the same as in the solution of equations containing only one unknown quantity. For instance, in the equations just given, if we substitute in the second the

value of y as given by the first, or $y = \frac{24}{x}$, we have $x^2 + \frac{(24)^2}{x^2} = 52$, which may be solved as a quadratic equation. The general theory of equations, then, is concerned principally with the solution of equations involving one unknown quantity only, for to this sort all others reduce themselves. Indeterminate equations are such as do not set forth sufficient relations between the unknown quantities for their absolute determination, and which accordingly admit of various solutions. Thus, $xy = 24$ is an indeterminate equation, which is satisfied by the values $x = 13$, $y = 8$; or $x = 3$, $y = 4$; or $x = 2$, $y = 12$. We require some other relation, such as $x^2 + y^2 = 52$, to enable us to fix on one of the sets of values, x and y , as those of x . For other kinds of equations, see EXPONENT AND EXPONENTIAL: FUNCTIONS: DIFFERENCE.

The object of all computation is the determination of numerical values for unknown quantities, by means of the relations which they bear to other quantities already known. The solution of equations, accordingly, or, in other words, the evolution of the unknown quantities involved in them, is the chief business of algebra. But so difficult is this business, that, except in the simple cases where the unknown quantity rises no higher than the second degree, all the resources of algebra are as yet inadequate to effect the solution of equations in general and definite terms. For equations of the second degree, or quadratic equations, as they are called, there is a rigorous method of solution

EQUATION.

by a general formula; but as yet no such formula has been discovered for equations even of the third degree. It is true, that for equations of the third and fourth degrees general methods exist, which furnish formulas which express under a finite form the values of the roots: see **CARDAN: CUBIC EQUATIONS**. But all such formulas are found to involve *imaginary* expressions, which, except in particular cases, make the actual computations impracticable till the formulas are developed in infinite series, and the imaginary terms disappear by mutually destroying one another. What is called Cardan's formula, for instance (and all others are reducible to it), is in this predicament whenever the values of the unknown quantity are all real; and accordingly, in nearly all such cases, the values are not obtainable from the formulæ directly, but from the infinite series of which they are the compact expression. But though such formulæ as Cardan's are useless for the purpose of numerical computation, the search for them has led to most of the truths which constitute the general theory of equations, and through which their *numerical solution* may be said to have been at last rendered effective and general. This method of numerical solution is a purely arithmetical process, performed upon the *numerical coefficients* of equations, and it is universally applicable, whatever the degree of the E. may be. With this method are connected the names of Budan, Fourier, Horner, and Sturm: see Young's *Theory and Solution of Algebraical Equations of the Higher Orders*; Peacock's *Treatise on Algebra*; and La Grange's work on *Numerical Solutions*.

The rules for the solution of the simpler forms of equations are in all elementary text-books of algebra. It must suffice to notice here a few of the leading general properties of equations. By the roots of an E. are meant those values real or imaginary of the unknown which satisfy the equality; and it is a property of every E. to have as many roots and no more as there are units in its degree. Thus, a quadratic E. has two roots; a cubic E., three; and a biquadratic, four. The quadratic E. $x^2 + 5x - 36 = 0$ has two roots, $+9$ and -4 , which will be found to satisfy it. Further, the expression $x^2 + 5x - 36 = (x - 9)(x + 4) = 0$; and generally if the roots of an E.

$$F(x) = x^n \pm A_{n-1}x^{n-1} \pm A_{n-2}x^{n-2} \pm \dots \\ \pm A_1x \pm A_0 = 0$$

(to which general form every E. of the n th degree can be reduced), are

$$\begin{aligned} & \pm a_1 \pm a_2 \pm a_3 \dots \pm a_n \dots \\ \text{then} \quad & (x \mp a_1)(x \mp a_2)(x \mp a_3) \dots \\ & (x \mp a_n) = F(x) = 0. \end{aligned}$$

Hence, and from observing the way in which, in the multiplication of these factors, the coefficients

$$A_{n-1}, A_{n-2} \dots A_1, A_0$$

are formed, we arrive at the following important results.

A_{n-1} = the sum of the roots. with their signs changed.

EQUATION—EQUATION OF PAYMENTS.

A_{n-2} = the sum of the products of every two roots, with their signs changed.

A_{n-3} = the sum of the products of every three roots, with their signs changed.

A_0 = the product of the roots, with their signs changed.

The factors, it will be observed, are formed thus: If $+a_1$ be a root, then $x = a_1$, and $x - a_1 = 0$ is the factor. If the root were $-a_1$, then $x = -a_1$; and the factor would be $x + a_1 = 0$. Observing now the way in which, in multiplying a series of such factors, the coefficients of the resulting polynomial are formed, we arrive at this: that a complete E. cannot have a greater number of positive roots than these *changes* of sign from $+$ to $-$ and from $-$ to $+$ in the series of terms forming its first member; and that it cannot have a greater number of negative roots than there are *permanencies* or repetitions of the same sign in proceeding from term to term. From the same source, many other general properties of equations, or value in their arithmetical solution, may be inferred.

EQUATION, PERSONAL: in Astronomy, the correction of errors in recording the results of observations of an identical event by two or more observers. The errors most likely to occur are in the time-records of an event, some observers recording it a few seconds before its actuality, others shortly afterward. As the work of regular observers is too valuable to be discarded, their records may be utilized in computations when the amount of their average personal errors has been ascertained; and this is done by carefully examining a reasonable number of records of the same event or events by two or more observers, and indicating the average difference between their records.

EQUATION OF LIGHT: in astronomical observations, the allowance to be made for the *time* occupied by the light in traversing a variable space. The visual ray by which we see any body is not that which it emits at the moment of our seeing it, but that which it *did* emit some time before, viz., the time occupied by light in traversing the space which separates it from us. If, then, the body be in motion, its aberration, as due to the earth's velocity, must be applied as a correction, not to the line joining the earth's place at the moment of observation with that occupied by the body (as seen) at the same moment, but at that antecedent moment when the ray quitted it. Hence is derived a rule applied by astronomers for the rectification of observations made on a moving body, viz., from the known laws of its motion and the earth's, calculate its relative angular motion in the time taken by light to pass from it to the earth. This motion is the total amount of its apparent displacement. Its effect is to displace the body in a direction contrary to its apparent motion, an effect one part of which is due to aberration, properly so called (see **ABERRATION**), resulting from the composition of the motions of the earth and of light, and another part to the fact of the passage of light occupying time.

EQUATION OF PAYMENTS: arithmetical problem

EQUATION OF TIME.

—to find a time when, if a sum of money be paid by a debtor, which is equal to the sum of several debts payable by him at different times, no loss will be sustained by either the debtor or creditor. The rule generally given is as follows: Multiply each sum due by the time at which it is payable, and then divide the sum of the products by the sum of the debts: the quotient is the equated time. For example, if £10 be due at one month, and £20 at two months, find as an equivalent when the whole £30 may be paid at once. Ans. $\frac{10 \times 1 + 20 \times 2}{30} = 1\frac{2}{3}$ months. This

rule, however, is incorrect where the debts are unequal, because it takes no account of the balance of interest and discount. A correct rule for the case of two debts and simple interest is subjoined. Let d and D denote the debts, t and T the times of payment, and r one year's interest on D .

Then if $A = T + t + \frac{D + d}{dr}$, and $B = Tt + \frac{DT + dt}{dr}$, the

equated time will $= \frac{1}{2}A - \frac{1}{2}\sqrt{A^2 - 4B}$. When three or more debts are concerned, the plan is to find by this formula the equated time for the first two, and then for their sum payable at their equated time, and the third, and so on. The common rule is, however, sufficiently correct for ordinary use.

EQUATION OF THE CENTRE: addition or subtraction of the quantity by which the true and the mean longitude of the earth differ. If the earth moved uniformly round the sun in a circle, it would be easy to calculate its longitude or distance from the line of equinoxes at any time. One year would be to the time since the vernal equinox as 360° to the arc of longitude passed over. But the orbit of the earth is not circular, nor is its motion uniform; the orbit is slightly elliptical, and the motion is quicker at perihelion than at aphelion. The true rule, then, for ascertaining the earth's longitude is contained in the following proportion: one year is to the time elapsed as the whole area of the earth's orbit is to the area swept over by the radius vector in the time. This is a deduction from Kepler's law (see CENTRAL FORCES), that, in planetary motion, equal areas (not *angles*) are swept over in equal times. The area swept over being ascertained from the laws of the earth's motion, and the elements of its orbit, it is a question of geometry to ascertain the *angle* corresponding to the area, or the true longitude. In astronomy, the longitude, as calculated on the supposition that the earth moves uniformly in a circle, is called the *mean* longitude of the earth; and it happens, from the orbit being but slightly different from a circle, that the mean and true longitude differ but slightly. By the *equation of the centre*, this difference is sometimes to be added to, sometimes to be subtracted from, the mean longitude, to obtain the true; and sometimes it is zero.

EQUATION OF TIME: addition or subtraction of the difference between apparent and mean time. Under EQUA-

EQUATORIAL.

TION OF THE CENTRE (q.v.) it is noted that the earth's motion in the ecliptic—or what is the same, the sun's apparent motion in longitude—is not uniform. This want of uniformity would of itself obviously cause an irregularity in the time of the sun's coming to the meridian on successive days; but besides this want of uniformity in the sun's apparent motion in the ecliptic, there is another cause of inequality in the time of its coming on the meridian—viz., the obliquity of the ecliptic to the equinoctial. Even if the sun moved in the equinoctial, there would be an inequality in this respect, owing to its want of uniform motion; and even if it moved uniformly in the ecliptic, there would be such an inequality, owing to the obliquity of its orbit to the equinoctial. These two independent causes jointly produce the inequality in the time of its appearance on the meridian, the correction for which is the equation of time.

When the sun's centre comes to the meridian, it is apparent noon, and if it moved uniformly on the equinoctial, this would always coincide with *mean noon*, or 12 o'clock on a good solar clock. But from the causes above explained, mean and apparent noon differ, the latter taking place sometimes as much as $16\frac{1}{2}$ minutes before the former, and at others as much as $14\frac{1}{2}$ minutes after. The difference for any day (called the equation of time) is stated in ephemerides for every day of the year. It is nothing or zero at four different times in the year, at which the whole mean and unequal motions exactly agree—viz., about Apr. 15, June 15, Aug. 31, and Dec. 24. At all other times, the sun is either too fast or too slow for clock-time. In the ephemerides above referred to, the sign + or — is prefixed to the equation of time, according as it is to be added to or subtracted from the apparent time to give the mean time: see NAUTICAL ALMANAC.

EQUATORIAL: important astronomical instrument, by which a celestial body may be observed at any point of its diurnal course. It consists of a telescope attached to a graduated circle, called the declination circle, whose axis penetrates at right angles that of another graduated circle called the hour circle, and is wholly supported by it. The pierced axis, which is called the principal axis of the instrument, turns on fixed supports; it is pointed to the pole of the heavens, and the hour circle is of course parallel to the equinoctial. In this position, it is easy to see that a great circle of the heavens corresponding to the declination circle, passes through the pole, and is an hour circle of the heavens. The telescope is capable of being moved in the plane of the declination circle. If, now, the instrument be so adjusted that the index of the declination circle must point to zero when an equatorial star is in the centre of the field of view of the telescope, and the index of the hour circle must point to zero when the telescope is in the meridian of the place, it is clear that when the telescope is directed to any star, the index of the declination circle will mark the declination of the star; and that on the other circle its right ascension. If the telescope be clamped when direct-

EQUERRY—EQUESTRIAN ORDER.

ed on a star, it is clear that, could the instrument be made to rotate on its principal axis with entire uniformity with the diurnal motion of the heavens, the star would always appear in the field of view. This rotation is communicated to the instrument by clock-work.

EQUERRY, n. *ĕk'wĕr-ĭ*, also spelled **EQ'URY** [F. *écurie*, a stable—from OF. *escuyer*, a squire who attended on a knight, part of whose duties was to look after his master's horse—from mid. L. *scūrĭā*, stables, a barn: O.H.G. *scura*, an outhouse: F. *escuyrie*, a squire's place]: an officer in a prince's household who has the care of the horses, and attends him in public.

EQUESTRIAN, a. *ĕ-kwĕs'trĭ-ăn* [L. *equestris*, belonging to horsemen—from *equĕs*, a horseman: F. *équestre*]: pertaining to horses or horsemanship; being on horseback; denoting an order of anc. Roman knights: N. a skilful rider on horseback. **EQUES'TRIANISM**, n. *-ăn-ĭzm*, skilful or professional riding on horseback; the art or recreation of riding (see **HORSEMANSHIP**). **EQUESTRIAN STATUE**, representation of a man on horseback. Equestrian statues were awarded as a high honor to military commanders and persons of distinction in Rome, and latterly were, for the most part, restricted to the emperors, the most famous in existence being that of Emperor Marcus Aurelius, now in the Piazza of the Capitol at Rome. It is the only ancient equestrian statue in bronze that has been preserved; an exemption which it probably owed to the fact that for centuries it was supposed a statue of Constantine. The action of the horse is so fine, and the air of motion so successfully given to it, that Michael Angelo is said to have called out to it 'Cammina!'—(Go on, then!). It was originally gilt, and traces of the gilding are still visible on the horse's head. So highly is this statue prized, not only for its artistic but its historical value, that an officer used regularly to be appointed by the Roman govt. to take care of it, under the designation of the Custode del Cavallo. On the occasion of the rejoicings by which Rienzi's elevation to the tribuneship was celebrated 1347, wine was made to run out of one nostril and water out of the other of this famous horse. The statue then stood in front of the Church of St. John Lateran, near to which it was found, and a bunch of flowers has always been presented annually to the chapter of that basilica, in acknowledgment of ownership, since it was removed to its present site on the capitol. All European capitals are adorned, or disfigured, by numerous equestrian statues, London belonging pre-eminently to the latter category. They are seen also in some principal cities of the United States.

EQUES'TRIAN ORDER, or **EQUITES**, *ĕk'wĭ-tĕz*: originally the cavalry of the Roman army; said to have been instituted by Romulus, who selected from the three principal Roman tribes 300 equites. This number was afterward gradually increased to 3,600, partly of patrician partly of plebeian rank, required to possess a certain amount of property. Each of these equites received a horse from the

EQUI—EQUIDÆ.

state; but about B.C. 403, a new body of equites began to appear, who were obliged to furnish a horse at their own expense. These were probably wealthy *novi homines*, men of equestrian fortune, but not descended from the old equites (for it should be observed that the equestrian dignity was hereditary). Until B.C. 123, the equites were exclusively a military body; but in that year Caius Gracchus carried a measure, by which all the *judices* had to be selected from them. Now, for the first time, they became a distinct order or class in the state, and were called *Ordo Equestris*. In B.C. 70, Sulla deprived them of this privilege; but their power did not then decrease, as the forming of the public revenues appears to have fallen into their hands. After the conspiracy of Catiline, the E. O., which on that memorable occasion had vigorously supported the Consul Cicero, began to be looked upon as a third estate in the Republic; and to the title of *Senatus Populusque Romanus* was added *et Equestris Ordo*. But, even in the beginning of the empire, the honor, like many others, was so indiscriminately and profusely conferred, that it fell into contempt, and the body gradually became extinct. As early as the later wars of the Republic, the equites had ceased to constitute the common soldiers of the Roman cavalry, and figure only as officers.

EQUI, *ē'kwī* [L. *æquus*, equal]: a prefix meaning equal, alike—as, **EQUILATERAL**, equal sided. **EQUIVALVED**, having both valves alike. *Note*.—The words of which *equi* forms the prefix are mostly self-explanatory.

EQUIANGULAR, a. *ē'kwī-āng'gū-lēr* [L. *æquus*, equal; *angulus*, a corner or angle], having equal angles. A figure is said to be equiangular all whose angles are equal to one another, as a square, or any regular polygon. Also triangles and other figures, whose corresponding angles are equal, are said to be equiangular one with another.

EQUIDÆ, *ēk'wī-dē* or *ē'kwī-dē* (or *Solidungula*): family of mammalia of the order *Ungulata*, sub-order *Perissodactyla*; containing only a small number of species, which so nearly resemble each other that almost all naturalists agree in referring them to one genus, *Equus*. They are distinguished from all other quadrupeds by the complete consolidation of the bones of the toes, or the extraordinary development of one toe alone in each foot, with only one set of phalangeal and of metacarpal or metatarsal bones, and the extremity covered by a single undivided hoof. There are, however, two small protuberances (*splint bones*) on each side of the metacarpal or metatarsal bone (*canon* or *cannon bone*), which represent other toes. The E. have six incisors in each jaw, and six molars on each side in each jaw; the males have also two small canine teeth in the upper jaw, sometimes in both jaws, which are almost always wanting in the females. The molars of the E. have square crowns, and are marked by laminæ of enamel with ridges forming four crescents. There is a wide space between the canine teeth and the molars. The stomach of the E. is simple, but the intestines are long, and the cæcum extremely large; the digestive

EQUIDIFFERENT—EQUINIA.

organs being thus very different from those of the ruminants, but exhibiting an equally perfect adaptation to the same kind of not easily assimilated food. Another distinctive peculiarity of the E. is, that the females have two teats situated on the pubes, between the thighs. But notwithstanding these characters, so dissimilar to those of the ruminants, they approach them very much in their general conformation, and may be regarded as a connecting link between pachyderms and ruminants. The largely developed and flexible upper lip is a character which belongs to the former rather than to the latter order.

The E. are now found in a truly wild state only in Asia and Africa. Fossil remains exist in the newer geological formations in great abundance in many parts of the old world; very sparingly, however, in the new, though the bones of a peculiar and distinct species (*Equus curvidens*), belonging to the Pleiocene period, have been found in S. America.

The horse and the ass are by far the most important species of this family. The dziggethai also has been domesticated and made useful to man. Of the other species, the zebra, quagga, and dauw, it is generally believed that they are incapable of useful domestication. EQUUS, ē'kwōs, n. genus of ungulates, typical of the family *Equidæ*.

EQUIDIFFERENT, a. ē'kwō-dif'fēr-ēnt [L. *æquus*, and *different*]: arithmetically proportional.

EQUIDISTANT, a. ē'kwō-dis'tānt [L. *æquus*, equal; *distant* or *distan'tem*, far asunder]: at an equal distance from some point or place. E'QUIDIS'TANCE, n. E'QUIDIS'TANTLY, ad. -lŭ.

EQUILATERAL, a. ē'kwō-lăt'ēr-ăl [L. *æquus*, equal; *latus*, a side]: having all the sides equal. A square is equilateral. The equilateral hyperbola is that whose axes and conjugate diameters are equal.

EQUILIBRATE, v. ē'kwō-lī'brăt [L. *æquus*, equal; *librātus*, weighed, balanced]: to balance equally two scales, sides, or ends.

EQUILIBRIUM, n. ē'kwō lib'rĭ-ŭm [L. *æquilibrium*, a horizontal position—from *æquus*, equal; *libra*, a balance]: equality of weight, power, or force, etc; the state of rest or balance of a body or system, solid or fluid, resulting from the action of two opposite and equal forces, or of various forces: see STATICS: HYDROSTATICS.

EQUIMULTIPLE, n. ē'kwō-mŭl'tĭ-pl [L. *æquus*, equal, and *multiple*]: a number which has been multiplied by the same number or quantity as another: ADJ. multiplied by the same number or quantity.

EQUINE, a. ē'kwĭn, or EQUINAL, a. ē-kwĭ'năl [L. *equinus*, pertaining to horses—from *æquus*, a horse: It. *equino*]: pertaining to horses.

EQUINIA, ē-kwĭn'ĭ-a, or GLANDERS, in the Human Subject: disease affecting man, to whom it is transmissible from animals: see GLANDERS. It is remarkable that though the disease in the horse and ass has been recognized from the time

EQUINIA.

of Aristotle (who describes it as common in the ass), it was not till 1810 that Waldinger of Vienna drew attention to the fact, that special precautions should be taken in the dissection of the horses affected with glanders and farcy, inasmuch as the most serious and often fatal consequences might arise from the inoculation of the morbid matter. Strangely, however, he does not seem to have noticed that the disease thus induced in man is identical with that of the horse; and it was not till 1821 that Schilling recognized this important point. It was not till Dr. Elliotson published his *Memoir On the Glanders in the Human Subject*, 1830, that the attention of the British medical profession was directed to the subject. In 1837, Rayer in his *Memoir De la Morve et du Farcin chez l'Homme*, gave a description of glanders both in the horse and in man; and in 1843, Tardieu published *De la Morve et du Farcin Chroniques*. It is to these writers, and to the brothers Gamgee, in Reynolds's *System of Medicine*, that we owe almost all our knowledge of this terrible disease, one of the maladies lately shown by German investigators to be due to the attacks of a special kind of Bacterium (q.v.: see also GERM THEORY).

In the great majority of cases, the transmission is from the horse, the ass, or the mule to man; but several instances have been recorded in which it has been transmitted from one human being to another. The disease is no doubt generally due to inoculation, but the virus is probably capable also of being absorbed by unbroken mucous membrane. Most of the recorded cases have occurred in men of good constitution and in the prime of life. The four varieties of this disease which occur in the horse have been observed in man—viz., (1) Acute Glanders, (2) Chronic Glanders, (3) Acute Farcy, (4) Chronic Farcy.

Acute Glanders is the commonest form. The period of inoculation ranges, in the majority of cases, from three days to a week. If there is a distinct wound or abrasion through which the poison has been absorbed, the parts around the broken surface become red, tense, and painful, often before the appearance of any of the constitutional symptoms, such as a general feeling of illness, great depression of the spirits, headache, rigors, increased rapidity of the pulse, and pain in the joints. A characteristic pustular eruption, often accompanied by bullæ or blebs, appears on the face and limbs; and abscesses frequently occur on the face and about the principal joints. A yellow, purulent, fetid discharge, often mixed with blood, exudes from the nasal mucous membrane, which is invariably the seat of a pustular eruption, or of ulcerations. The prostration observable from the beginning increases during the disease. The pulse becomes weak and frequent, the breathing difficult, the voice feeble, and the bowels very relaxed, the stools being extremely fetid. Delirium now sets in, which is followed by coma and death. Death usually occurs about the end of the second week, but the duration of the disease has been known to vary from 3 to 59 days.—*Chronic Glanders* is so rare an affection in man that it hardly requires notice. The course of the disease usually extends over

EQUINOX.

several months; and only one case of recovery is reported.—*Acute Farcy* seems to differ essentially from acute glanders only in the fact of there being no affection in the mucous membrane of the nostrils. The cutaneous eruption may or may not be present; in most cases, it is present, and the disease then follows exactly the same course as glanders. When there is no eruption, there is merely an inflammation of the lymphatic vessels and glands, or *Adenitis* and *Angeioleucitis* (q.v.), accompanied with the formation of soft subcutaneous tumors at various parts. This form of the disease often terminates favorably, or may merge into *Chronic Farcy*, which is characterized by the formation of an abscess on the forehead or elsewhere, succeeded by indolent and fluctuating tumors, which follow one another in various parts of the body, open spontaneously, and form very intractable ulcers. The disease usually runs its course in about a year. Of 22 cases recorded by Tardieu, six recovered.

Little need be said regarding treatment, since no remedies have been found to exercise any influence in checking the course of acute glanders. Arsenic, combined with strychnia, has been found useful in chronic glanders in the horse, and is recommended by the brothers Gamgee as worthy of trial in man; and some relief might probably be afforded by the application of weak injections of carbolic acid into the nostrils.

EQUINOX, n. *ē'kwō-nōks* [L. *æquinoctium*, the equinox—from *æquus*, equal; *nox*, night; *noctes*, nights]: the time when the sun enters on the equinoctial line—the sun rising higher in the heavens every day at noon till the point (equinoctial) is reached when the days and nights are of equal length all over the world, making what is called the *vernal* or *spring equinox*, about March 21; when the same point is reached in descending, the sun makes what is called the *autumnal equinox*, about Sep. 23. At the vernal equinox, the sun is passing from s. to n., and in the n. hemisphere the days are lengthening; at the autumnal, he is passing from n. to s., and the days are shortening. As the earth moves more rapidly when near the sun, or in winter, the sun's apparent motion is not uniform, and it happens that he takes eight days more to pass from the vernal to the autumnal equinox, than from the latter to the former. The equinoctial points are not stationary. Sometimes they are called the equinoxes, but commonly by equinoxes is meant the time when the sun enters those points. See **ECLIPTIC**. **E'QUINOCTIAL**, a. *-nōk'shāl*, pertaining to the equinoxes and the regions under the equinoctial; designating an equal length of day and night; occurring at the time of the equinoxes, as the *equinoctial gales*: N. the celestial equator (see **EQUATOR**, **CELESTIAL**), the great circle of the celestial concave which divides the heavens into the n. and s. hemispheres, and which derives its name from the phenomenon that at all places on the earth's surface beneath this circle, the nights are equal all the year round, being of the constant length of 12 hours, the sun setting at 6 P.M. and rising at 6 A.M.; the circle in the heavens which the sun appears to describe when the days

EQUIP—EQUISETACEÆ.

and nights are of equal length. EQUINOCTIAL POINTS, those in which the equinoctial and the ecliptic intersect (see ECLIPTIC); sometimes called the equinoxes (see EQUINOX). EQUINOCTIAL TIME, time reckoned from the instant when the point of Aries passes the Vernal Equinox (see EQUINOX): this instant is selected as a convenient central point for a uniform reckoning of time by astronomical observers. E'QUINOCT'IALLY, ad. -ly.

EQUIP, v. ē-kwīp' [F. *équiper*, to accouter: Icel. *skipa*, to arrange: AS. *scēapan*, to form: Ger. *schaffen*, to create, to provide]: to fit out; to furnish with whatever is necessary. EQUIP'PING, imp. EQUIPPED', pp. -kwīpt'. EQUIP'MENT, n. [F. *équipement*]: all necessary articles or furnishings as for an expedition or voyage. EQUIPAGE, n. ēk'wī-pāj [F. *équipage*]: the carriages, horses, liveried servants, etc., of a gentleman, nobleman, or prince; the furniture and necessities of an army or ship of war, etc. EQ'UIPAGED, a. -pāj'd, furnished with an equipage.—*Equipment*, *Equipage*, in *military matters*, names of certain of the necessities for officers and soldiers, comprising horses, horse-appointments, baggage, saddlery, accouterments, etc. The equipment of a private soldier is often used as a name for the whole of his clothes, arms, and accouterments collectively. The *equipage* of an army is of two kinds: it includes all the furniture of the camp, such as tents and utensils, under the name of *camp-equipage*; while *field-equipage* comprises saddle-horses, baggage-horses, and baggage-wagons.—BUREAU OF EQUIPMENT AND RECRUITING, in the U. S. navy, department for supplying vessels with all articles necessary for a voyage, such as rigging, sails, anchors, etc.; charged also with the enlistment of seamen, and with the recruiting service in general.

EQUIPOISE, n. ē'kwī-poyz [L. *æquus*, equal: F. *poids*, weight]: equality of weight; equilibrium.

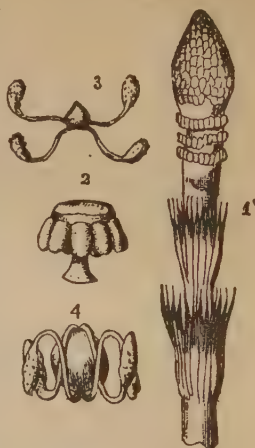
EQUIPOLLENT, a. ē'kwī-pōl'lěnt [L. *æquus*, equal; *pollen tem*, being able: F. *équipollent*]: having equal power, strength, or force; equivalent. E'QUIPOL'LENCE, n. -lěns, or E'QUIPOL'LENCY, n. -lěn-si, ability, power, or force in the same degree.

EQUIPONDERANT, a. ē'kwī-pōn'dér-ănt [L. *æquus*, equal; *pondus*, weight; *pondëris*, of weight]: being of the same weight. E'QUIPON'DERANCE, n. -ăns, equality of weight; equipoise.

EQUISETACEÆ, n. plu. ēk'wī sē-tā'si-ē, or EQUISETUMS, n. plu. ēk'wī-sē'tūms [L. *equisetis*, the plant horse-tail—from *æquus*, a horse; *setū*, a thick stiff hair or bristle]: an extensive order of marsh or boggy cryptogamic plants, represented by the common *horse-tail*. EQ'UISE'TITES, n. plu. -sē'tītz, in *geol.*, fossil plants, resembling the equisetum of our pools and marshes. EQUISETIC, a. ēk'wī-sēt'ik, obtained from the equisetums. EQUISETUM, genus of cryptogamous plants, the structure and affinities of which are not yet well understood, but which many botanists regard as constituting a suborder of ferns, while others prefer to

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make it a distinct order, *Equisetaceæ*. The English name HORSE-TAIL is often given to all the species. They have a leafless, cylindrical, hollow, and jointed stem, each joint terminating in a membranous and toothed sheath, which incloses the base of the one above it. The fructification is at the summit of the stem in spikes, which somewhat resemble trobiles (cones), and are formed of scales bearing spore-cases on their lower surface. The spores are minute, oval, or round, green, and each accompanied with four elastic and hygrometrical threads. These threads are sometimes called *elaters*, but it is by no means certain that they are of the same nature with the spiral filaments so called, which are mixed with the spores of many *Hepaticæ* (q.v.). Each thread terminates in a kind of club. The stems generally have lateral branches, angular, but otherwise similar in structure to the stem, growing in whorls from the joints; sometimes the stem is simple; or fertile stems are simple, and sterile stems are branched. The species of this genus contain a peculiar acid, called *Equisetic Acid*. Astringent and diuretic properties exist in these plants, and they were formerly used in medicine, but are not now regarded as of much value. It has been said that they are very injurious to cattle which eat them, but this lacks confirmation. They abound chiefly in damp soils, and sometimes so much that the plough and harrow, or the grubber, must be employed to extirpate them. Some, however, grow in dry fields and gardens; while others are found chiefly in ditches or the banks of rivers. They exist in almost all parts of the world, and are seldom large, varying from a few inches to a few ft. in height, but a comparatively gigantic species has recently been discovered in tropical America. The rough siliceous stems of some species are used for smoothing and polishing wood, particularly those of *E. hyemale*, which are exported in considerable quantities from Holland, under the name of DUTCH RUSHES. The stems of this species are unbranched, or a little branched only at the base. It is not uncommon in Britain, and is found also, rather sparingly, in N. America. It has been proposed to cultivate it, as it grows well under trees, where few other plants would thrive. The stems of other species, as *E. arvense*, are used for scouring tin and pewter vessels.



Equisetum Telmateia:

- 1, summit of fertile stems with fructification; 2, a scale, with its stalk (lateral view); 3, a spore, with its filaments unrolled; 4, a spore, with its filaments hygrometrically rolled up.

EQUITABLE, a. ěk'wĩ-tă-bl [F. *équitable*—from L. *æquĩtā* tem, justice—from *æquus*, equal]: fair; just· giving equal

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justice; doing justice; impartial. **Eq'UITABLY**, ad. *-blī*. **Eq'UITABLENESS**, n. *-bl-nēs*, the quality of being just; state of doing justice. **Eq'UITY**, n. *-tī* [F. *équité*, equity—from L. *equitātem*]: impartial distribution of justice; just regard to right or claim; the supplying of the defects in law by judging according to reason and justice. **EQUITABLE DEFENSE** at common law, one among certain legal defenses applicable equally to courts of equity and common law. A good example of these is the statute of limitations, whereby claims are outlawed after a lapse of years. But there are particular defenses peculiar to courts of equity. One of these is 'founded upon the mere lapse of time and the staleness of the claim in cases where no statute of limitations governs the case' (Story *Eq. Jur.* § 1520). Other peculiar equitable defenses are, part performance of a parol contract, respecting lands, as against the statute of frauds; account stated; plea of a purchase for a valuable consideration without notice; and want of proper parties to a bill. These defenses were either unknown at common law or were not applied except within rigorously narrow and technical limits. In many of the American states, equitable and legal defenses may be united. **EQUITABLE ESTATE**, right, title, or interest in property, real or personal, distinct from the *legal* estate. In the eye of the law the *legal* owner has the direct and absolute dominion over the property, but the equitable owner, also styled the 'beneficiary' or *cestui que trust* is entitled to the avails and income arising therefrom. The rights of owners of equitable estates are enforceable in courts of equity. The relation between the legal owner and the owner of the equitable estate constitutes what is known in law as a 'trust.' See **USES: TRUST.**—**EQUITABLE MORTGAGE**, mortgage of an equitable interest in an estate. The underlying idea of a mortgage is a transaction intended as a security for the payment of money or the doing of some specified act. Usually it takes the form of a conveyance of property to be held as the security until the condition is fulfilled. Cases arise, however, in which, though there are no conveyances of property, it is necessary, for the purpose of doing justice to imply liens in the nature of mortgages denominated 'equitable mortgages.' They are construed from the relations or contracts of the parties. A modern writer (Thomas on Mortgages) thus defines these liens: 'Equitable mortgages are simply securities by which no legal interest in the property mortgaged passes to the creditor, and thus include those transactions in which property, or the evidences of property, come into the hands of the creditor, upon a written or verbal, express or implied, agreement that such property shall be answerable for the debt, as well as those transactions in which the intention or duty of creating a charge on property is held to arise from an express or implied contract to render that property liable.' A familiar method in England of creating such liens is by the deposit of title deeds to real estate as a security for the loan of money. In consequence of statutes almost universally prevailing in this country requiring mortgages of real estate to be recorded

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if intended to operate as to third parties, the mode of creating equitable mortgages by deposit of title deeds is not recognized to any great extent. The cases in the United States in which equitable mortgages upon lands have been most frequently sustained, are those in which agreements were made to give a lien but the instruments were defectively or imperfectly executed, or where the parties intending to create a lien have used inapt words for that purpose, or where deeds of real estate absolute on their face, yet contained a reservation in favor of the grantor or some third party. Closely analogous, though perhaps not strictly partaking of the nature of a mortgage, is the lien of a seller of real estate for unpaid purchase money. The remedy of the holder of an equitable mortgage is a suit in equity to enforce the same by a sale of the land. . See also MORTGAGE: ESTATE. COURT OF EQUITY, a tribunal, distinct from the common law courts of the country, in which justice is administered by a separate body of rules created and sustained on the strength of precedents or usage; or in which cases are decided according to reason and justice, when they appear to be excepted from the general provisions of the law: see CHANCERY.—SYN. of 'equitable': honest; candid; reasonable; right; upright.

EQUITANT, a. *ěk'wǐ-tǎnt*]L. *equitant'tēm*, riding—from *equēs*, a horseman]: in *bot.*, applied to a form of vernation, in which the leaves are folded forwards longitudinally on the mid-rib, so that their edges meet, and each embraces the one which is placed next within it; folded leaves when each successively embraces only one-half of the next, are said to be *half-equitant*.

EQUITATION, n. *ěk'wǐ-tǎ'shŭn* [F. *équitation*, horsemanship—from L. *equitātīōnem*—from *equēs*, a horseman]: the act or art of riding on horseback; horsemanship.

EQUITES: see EQUESTRIAN ORDER.

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EQUITY: see under **EQUITABLE**.

EQUITY, COURTS OF: a department in judicial administration (see **EQUITY, PRINCIPLES OF**); formerly recognized in England by separate courts—which separation was inherited by the British colonies, but is now largely discarded in the United States. The administration of justice in England formerly embraced two great branches, known as common law and equity. Speaking generally, it may be said that equity is partly corrective of the common law, partly supplementary of it; and from this it follows that, in an almost endless variety of matters, the decision of a court would vary according as it was a court of equity or a court of common law; the equity courts giving remedies in cases where the common law—though it may acknowledge a hardship—sees no wrong; and acknowledging and enforcing rights which the common law does not admit. The anomaly of keeping up two sets of courts, acting on different principles, the one to do justice where the traditions of the other prevent it from doing justice, or its rules require it to do injustice, had long been perceived; it had been found, too, that this arrangement was inconvenient as well as anomalous. After attempts at gradual fusion of the conflicting systems by clothing the common-law courts to some extent with the power of resorting to the remedies and admitting the principles employed in the courts of equity, legislative provision was made 1873 for completely revolutionizing the judicial system of England, with a view to a riddance, at one stroke, of its inconvenient and anomalous double system of courts. This was done by the Judicature Act, which was modified 1874-5, and all came into force 1875, Nov. 1 (see **COMMON LAW, COURTS OF**). The Judicature Act merged the existing courts both of equity and common law in one supreme court of judicature, which consisted of a high court of justice in five divisions (now three), all of them courts of first instance. There was an appeal in a few cases to the privy council; and in the other cases to the court of appeal, and then to the house of lords. In the high court there is now a chancery division, before which, at first, the greater part of the equity business requires to be brought; and it is expressly provided that where the rules of the common law conflict with those of equity, every court is to give effect to the latter. The conflict between common law and equity thenceforth ceased; but as the sources from which the law is and will be derived, they will still be referred to.

The origin of a separate equitable jurisdiction in England is found in the early adoption by the courts of common law of certain set forms for the redress of grievances, and their refusal to apply any remedy to cases which did not fall within those limits. Suitors finding that in numerous cases redress was not to be obtained in the ordinary legal tribunals, had recourse to the king as the fountain of justice, who, sitting in council, heard the complaints upon their merits without reference to the technicalities of law. As early as the reign of Edward I., the practice began to be adopted of delegating to the chancellor (q.v.) the petitions referred to the king. In this reign, an attempt was made to devise a method whereby the common-law courts should be made

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the sole tribunal for the redress of grievances. By the statute of Westminster the second (13 Edw. I, c. 24), it was enacted that whenever a case occurred requiring a new writ, the chancery (in which all suits took their rise) should frame a new writ to suit the case. This statute was never acted upon to the purpose intended; but in the reign of Edward III. its provisions were made use of by John Waltham, then chancellor, to introduce the writ of *Subpœna* (q. v.) returnable to chancery only, whereby the lord chancellor's court was made the forum of a large class of causes. 'From this time,' says Mr. Spence (*Chancery Jurisdiction*, i. 338), 'suits by petition or bill without any preliminary writ became a common course of procedure before the chancellor, as it had been in the council. On the petition or bill being presented, if the case called for extraordinary interference, a writ was issued by the command of the chancellor, but in the name of the king, by which the party complained against was summoned to appear before the court of chancery, to answer the complaint and abide by the order of the court.' Thus was introduced into chancery the practice of examining upon oath the party in the cause, a practice unknown at that time to common law. The cases heard in the chancery courts were decided upon the principles of *honesty, equity, and conscience*. The next step which tended to widen the equitable jurisdiction of the chancery courts, was the exclusion of the Roman law from the courts of common law. This was effected by a prohibition of the judges in the reign of Richard II. One result of this prohibition was to exclude altogether from the common-law courts the question of trusts. The court of chancery at once proceeded to give a remedy in this class of cases, which has ever since formed the most important branch of the equitable jurisdiction of that court. The equitable jurisdiction of the court of chancery in matters of fraud is to be traced to the abolition of the star chamber (q. v.) in the reign of Charles I. Thus sprung up in England jurisdiction of the court of chancery as a court of equity. It is not, however, to be supposed that the system administered in courts of equity is an arbitrary one at the pleasure of the presiding judge. Such probably was the case on the first introduction of the equity jurisdiction; but as time passed, the decisions of previous judges formed precedents for their successors, and the precepts of the Roman law were much imitated as a code for the regulation of the courts. Now, all the judges acknowledge the authority of decided cases—of the practice of the court—quite as fully as did courts of common law; and though new cases perhaps occur more frequently than they did in the courts of common law, they are dealt with as they were in courts of common law, by the application to them, as far as possible, of accepted principles derived from the decisions of the court of chancery, or the principles of the Roman law. See CHANCELLOR: CHANCERY, COURT OF.

The jurisdiction of equity courts was divided under three principal heads—exclusive, concurrent, and assistant. The first consists almost entirely of the administration of trusts; the second comprises questions of fraud, of account, and

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also, it is said (Smith's *Principles of Equity*, 217), of specific performance of agreements. This matter appears, however, to fall more naturally under the assistant jurisdiction. In order to appreciate the domain of the equity courts, it must be borne in mind that common law confines its remedy usually to the awarding of damages, and to the pronouncing a judgment absolutely in favor of either plaintiff or defendant; equity, on the other hand, goes into all the merits of the case, and will deliver a modified judgment where circumstances demand it. The judges of the supreme court now all administer equity as well as law in the same manner as the court of session in Scotland had been accustomed to do from the beginning. In whichever division of the high court an action commences, that division must dispose of all the issues raised, and pursue these to final judgment. It is true one of the divisions is still called the chancery division, and actions which used to be begun in equity courts now usually begin there still. But there is a power in such division to send an issue of fact to be decided on circuit, and after trial the division resumes its jurisdiction and works it out. The chancery division consists of judges chosen from the bar generally; and the court of appeal, which sits in two divisions, consists also of judges some versed in chancery business, and some versed in common law business. The lord chancellor since 1875 has confined his sittings to the house of lords, and occasionally to the court of appeal and to the privy council, of all of which courts he is *ex officio* a member.

Courts of Equity in the United States.—The principles according to which substantive equity is administered are the same in England and the United States. In fact, they must necessarily be the same the world over. In respect, however, to the mode of procedure, differences exist in the various American courts, though the practice formerly prevailing in the high court of chancery in England may be regarded as the basis of all the different systems. Courts of chancery, in which equity was administered as a separate system of jurisprudence, were early established in N. Y., N. Jer., Md., Del., S. Car., and Mich. The abolition of the court of chancery as a separate tribunal in N. Y., 1848, opened the way to a great reform, whereby equity and common law were to be administered in the same courts and the practice in each consolidated as far as possible. Passing from N. Y., the reformed procedure was adopted in O., Ky., Ind., Wis., Io., Minn., Miss., Kan., Neb., Nev., Cal., Or., N. Car., S. Car., Conn., Wash. Terr., Mont., Ida., Dak., Wyo., and Arizona. In most of the jurisdictions which have not adopted the plan of consolidation, namely the Federal courts, and Ark., Fla., Ga., Ill., Me., Md., Mass., Mich., N. Ham., Penn., R. I., Tex., Vt., Va., and W. Va., the two systems are kept distinct, but relief is administered by the same tribunal, sitting in one case as a court of equity and in another as a court of law. In some of the states the policy of strictly separating the two kinds of courts is retained, namely, Ala., Del., Miss., N. Jer., and Tennessee. The consolidation of the practice in equitable and common-law

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cases, which starting in New York, will gradually make its way all over the country, is one of the most important legal reforms of modern times. By its immense delay, vexation, expense, and uncertainty are spared the litigant. The most important subject usually brought before courts of equity in the United States, are applications for relief connected with trusts, fraud, mistake, injunctions, mortgages, accident, and account.

EQUITY, PRINCIPLES OF: in their widest sense, the principles of eternal justice, of which all human laws are but adaptations. 'Equity', says Lord Stair (i. l. s. 17), 'is the body of the law, and the statutes of men are but as the ornaments and vestiture thereof.' In this sense, equity coincides with the Roman precepts of law—*honesté vivere, alterum non ledere, suum cuique tribuere*—(Inst. i. l. s. 3), and with the principles of justice as laid down by the inspired writer—'to do justly, to love mercy, and to walk humbly with thy God' (Micah, vi. 8). As the object of human law is to give expression to these principles, equity is thus the basis of law. But it is impossible, in the nature of things, that any code of laws should provide a remedy suited to every particular case; it has, therefore, been found necessary in every civilized nation, to establish some form of authority which should control the rigor and remedy the deficiency of positive law. Thus, it is the function of the law to lay down a code of rules whereby the rights of property and the transactions of commerce shall be regulated; but by the diversities of life it happens that various circumstances will occur to cause these fixed rules to operate harshly or unjustly in particular cases. A party may complain that a contract duly entered into with all legal formalities has been obtained by fraud; the owner of an estate is incapable from infancy or lunacy of managing his affairs; a person ostensibly the owner of large property is found to be placed in possession in trust only for the benefit of others. In these and many other cases, the party who, in compliance with every rule of the law, is in possession, is not in fact the person who should in justice exercise the right. Here equity steps in. While, then, all law may be said to be equitable, inasmuch as it is the purpose of law to dispense justice, yet, in the technical sense, the term equity is confined to those cases not specially provided for by positive law. But, on the other hand, experience has shown that it would be most inconvenient, and subversive of order, if equity should arbitrarily interpose to remedy every apparent grievance, and therefore it is that the operation of equity is checked within certain limits. 'There are many cases against natural justice which are left wholly to the conscience of the party, and are without any redress, equitable or legal; and so far from a court of equity supplying universally the defects of positive legislation, it is governed by the same rules of interpretation as a court of common law, and is often compelled to stop where common law stops. It is the duty of every court of justice, whether of law or of equity, to consult the intention of the legislature.'—Story, *Principles of Equity*,

EQUITY OF REDEMPTION—EQUIVALENT.

s. 14. Hence arises the maxim, that 'equity follows the law.' The principles of equity, therefore, as understood in modern times, may be said to be those principles of natural justice which are permitted to modify the rigor of positive law. In applying these principles to practice, the equitable jurisdiction has been intrusted by almost all nations to the same courts in which the positive law was administered: see CHANCERY, COURT OF: EQUITY, COURTS OF: COMMON LAW: ETC. In the infancy of states, the boundaries of law and equity, and the functions of the equity judge, were not so clearly defined as in the present day. By the Roman law, a power, called the *jus honorarium* or *nobile officium*, was reposed in the pretor of controlling on equitable grounds the decisions of the ordinary tribunals. This function of the pretor commenced in the earliest times under the kings of Rome, and continued to attach to the office through all the changes which distracted the nation. Each pretor, on entering upon his office, published an edict declaring the principles by which he would be guided in discharging his duty as an equitable magistrate. The principles so declared were binding on the pretor during his year of office, but not on his successor. There can, however, be little doubt that in process of time a system of equity was gradually evolved; and ultimately, in the reign of the Emperor Hadrian, the edicts of the pretors were collected by a civilian named Julianus, and embodied in a single code called the Perpetual Edict: see EDICT. According to the practice of modern nations, the courts of law are accustomed to exercise a certain equitable jurisdiction whereby, within prescribed limits, the rules of law may be modified. In Scotland the equitable power of the court of session is called the *Nobile Officium* (q. v.).

EQUITY OF REDEMPTION: interest which a mortgager has in an estate which he has mortgaged. In Britain, equity of redemption may be devised, granted, or entailed, and the course of descent to an equity of redemption is governed by the same laws as the descent to the land would have been. Formerly, the equitable interest of a mortgager could not be recognized in a court of law, but by 7 Geo. II. c. 20, it is provided that where no suit is pending in a court of equity, either for foreclosure or redemption, but the mortgagee attempts to obtain possession by bringing an action of ejectment, in such a case, the court may restore his estate to the mortgager, on his payment of the principal and interest due on such mortgage.—In this country, the laws on this matter vary in different states.

EQUIVALENT, a. *ě-kwiv'ă-lěnt* [F. *équivalent*—from L. *equivālen'tem*—from L. *æquus*, equal; *vālens*, being worth, or of the value of]: equal in value or worth; equal in power, force, or effect; of the same import or meaning: N. that which is equal in value, weight, etc., to something else; offset; compensation; in *geol.*, strata or a series of strata that have been formed contemporaneously in distant regions, or which are characterized by similar suites of fossils. **EQUIVALENTLY**, ad. *-lě.* **EQUIVALENCE**, n. *-lěns*, equal value or

EQUIVOCAL—ERA.

worth; also EQUIV'ALENCY, n. -sī. EQUIVALENTS, in *chem.*, the quantities by weight of elementary substances which combine with one another to form definite compounds: see ATOMIC WEIGHTS.

EQUIVOCAL, a. ē-kwō'ō-kāl [L. *æquus*, equal; *vōcālīs*, sounding, speaking—from *vox*, a voice: It. *equivocale*]: of doubtful signification; uncertain; that may be understood in different senses; doubtful. EQUIVOCALLY, ad. -lī. EQUIVOCALNESS, n. a double meaning; ambiguity. EQUIVOCATE, v. -kāt, to use words of doubtful meaning; to quibble; to prevaricate; to evade. EQUIVOCATING, imp.: ADJ. using ambiguous words or phrases. EQUIVOCATED, pp. EQUIVOCATOR, n. -tēr, one who. EQUIVOCATION, n. -kā shūn, the use of words that have a double or doubtful meaning—usually in bad sense; prevarication. EQUIVOCATORY, a. -tēr-ī, containing or savoring of an equivocation. EQUIVOQUE, n. ā kī-vōk' or ē'kwō-vōk' [F.]: an expression in which a word has at once different meanings; a quibble.—SYN. of 'equivocal': ambiguous; indeterminate; dubious; prevaricating; evading; shuffling; quibbling.

ER: Eng. affix corresponding to the French *-eur* and La. tin *-or*, and used for forming nouns of agency. It is used for persons or things of any gender, but was originally masculine, the corresponding feminine forms being *-ster*, *-stre*, which also has lost its feminine force. As a rule words in *-or* are of Latin origin, those in *-er* of English origin, but there is a tendency to drop the former termination in favor of the latter. *Er* is an affix also denoting an inhabitant, native of, or dweller in a place. *Er* is also the sign of the comparative degree of adjectives in English; cognate with L. *-or*, and Gr. *-eros*. The *r* represents an original *s*. *Er* is an affix also used with verbs to give them a diminutive or frequentative force; as, pat, patter; spit, sputter.

ER, *ēr*: in *her.*, frequent abbreviation of the word *ermine*.

ERA, or ÆRA, n. ē'rā [L. *æra*, the particulars of an account, period of service, an era: F. *ère*. Sp. and It. *era*, age, era: akin to AS. *gear*, a year]: a fixed point of time from which a nation or people reckon their years, as Christian *era*; a succession of years from a fixed point, as 'we live in the Christian *era*' (see CHRONOLOGY); in *geol.*, the commencement of a new system or formation, or the entire duration of that system or formation. *Note*.—An *epoch* is a point of time fixed by historians, or a certain memorable period of years,—thus the capture of Constantinople is an *epoch* in the history of Mahometanism, while the flight of Mahomet is its *era*. The Crusades and the Reformation are *epochs* in the history of Christianity, but the birth of Christ begins its *era*. To indicate a starting-point of a series of events, we say, however, 'the *era* of the Reformation, of geology,' etc. *Age* denotes a certain indefinite but limited time embraced by joint human lives, and may even extend to centuries, as *iron age*: *generation*, a period embraced by an average human life.—SYN. of 'era': age; period; date; epoch; time.

ERADICATE—ERASE.

ERADICATE, v. *ě-răd'î-kăt* [L. *eradicātus*, plucked up by the roots—from *e*, out of; *rādix*, a root: It. *eradicare*]: to pull up by the roots; to destroy thoroughly; to extirpate. **ERAD'ICATING**, imp. **ERAD'ICATED**, pp. **ERAD'ICATOR**, n. *-tér*, one who. **ERAD'ICABLE**, a. *-kà bl*, that can be rooted up or completely destroyed. **ERAD'ICA'TION**, n. *-kă'shùn*, complete destruction; the state of being plucked up by the roots. **ERADICATIVE**, a. *-tiv*, that cures or destroys thoroughly.—**SYN.** of 'eradicate': to exterminate; root out; destroy.

ERAGROSTRIS, n. *ěr a-grôs'trîs* [Gr. *erôs*, love; mod. L. *agrostis*, with reference to the dancing spikelets of the flower]: in *bot.*, genus of grasses, tribe *Festuceæ*, family *Bromidæ*. Stendel enumerates 243 species. Some are cultivated as ornamental grasses.

ERANTHEMEÆ, n. *ěr-ăn-thě-mě'ě*: in *bot.*, tribe of *Acanthaceæ*. **ERAN'THEMUM**, n. *-mîm* [Gr. *eros*; *anthemon*, a flower]: in *bot.*, genus of *Acanthaceæ*, typical of the tribe *Eranthemææ*. Corolla salver-shaped, stamens four, only two of them fertile. About 20 species are cultivated in greenhouses.

ERANTHIS, n. *ěr-ăn'thîs* [Gr. *eros*, love; *anthos*, blossom, flower]: in *bot.*, winter-aconite. A genus of plants, order *Ranunculaceæ*. Sepals five to eight, narrow, petaloid, deciduous; petals small, clawed, and two-lipped; stamens many; carpels five to six, stipitate; follicles many-seeded.

ÉRARD, *â-râr'*, **SEBASTIEN**: 1752, Apr. 5—1831, Aug. 5; b. Strasburg, France: inventor and manufacturer. He was the son of a cabinet-maker, learned the manufacture of harpsichords in Paris, and under the patronage of the Duchess de Villeroy constructed the first piano-forte made in France, 1780. The popularity of the instrument induced him to establish a factory in Paris, in connection with his brother, Jean Baptiste E.; and within a short time the E. brothers became known as the best piano-forte manufacturers in Europe. During the French revolution the brothers carried on the manufacture of pianos and harps in London, but Sebastien returned to Paris 1796. He invented the grand piano with single and double action, and the famous double-action harp, made many other improvements in both instruments, and designed and built the great organ for the royal chapel of the Tuileries.

ERASE, v. *ě-răs'* [L. *erāsūs*, scraped out—from *e*, out of; *rāsus*, scraped: F. *raser*, to shave]: to scrape or rub out; to obliterate; to expunge; to blot out or deface. **ERA'SING**, imp. **ERASED'**, pp. *-răst'*. **ERA'SER**, n. one who, or that which. **ERA'SABLE**, a. *-să-bl*, that can be scraped out or obliterated. **ERASE'MENT**, n. *-měnt*, a rubbing out; obliteration. **ERA'SURE**, n. *-zhûr*, the act of scratching out; the place where a letter or word has been rubbed out. **ERASED AND ERADICATED**, in *heraldry*, applied to an object plucked off or torn out, showing a ragged edge; opposed to *coupé* or *coupy*, cut, which shows a smooth edge.—**SYN.** of 'erase': to efface; cancel; scrape out; blot out; destroy.

ERASISTRATUS—ERASMUS.

ERASISTRATUS, *ēr-a-sīs'tra-tūs*: one of the most famous physicians and anatomists of ancient times: lived B.C. 3d c.: supposed to have been born at Iulis, in the island of Ceos. He resided some time at the court of Seleucus Nicator, King of Syria, and while there acquired great renown by discovering and curing the disease of the king's eldest son, who was pining for the love of the young and beautiful Stratonice, whom his father in his old age had married. Afterward, E. lived at Alexandria, where, giving up practice, he applied himself with great energy and success to his anatomical studies. The date of his death (probably in Asia Minor) is not known. He founded a school of medicine, wrote several works on anatomy—in which branch he was most celebrated—on practical medicine, and pharmacy. He believed that the heart was the origin both of the veins and of the arteries, and, had it not been his conviction that the arteries contained *air* instead of *blood*, little doubt is entertained but that he would have anticipated Harvey in the discovery of the circulation of the blood. Of his numerous writings only some obscure fragments and titles have been preserved. Compare Hieronymus, *Erasistrati et Erasistrateorum Historia* (Jena 1790).

ERASMUS, *ē-rāz'mās*, **DESIDERIUS**: one of the most vigorous promoters of the Reformation: 1467, Oct. 28—1536, July 12; b. Rotterdam; illegitimate son of a Dutchman named Gheraerd, or Garrit, by the daughter of a physician. In accordance with the fashion among scholars of his time, he changed the name Gheraerd into its Latin and Greek equivalents Desiderius Erasmus (more correctly, Erasmus)—meaning desired, loved. Till his ninth year, E. was a chorister in the cathedral at Utrecht. He was then sent to school at Deventer, where his talents began to display themselves in so brilliant a manner, that it was even then predicted that he would be the most learned man of his time. After the death of his parents, whom he lost at the age of 14, his guardians determined on bringing him up to a religious life, and—with the intention, it is said, of sharing his small patrimony among themselves—in his 17th year, placed him in the monastery of Emaus, near Gouda. From this constrained life, however, he was released by the Bishop of Cambray. After having taken priest's orders 1492, he went to Paris, to perfect himself in theology and the humane sciences. Here he supported himself precariously by giving private lectures, and in 1497 accompanied some Englishmen, who had been his pupils, to England, where he was well received by the king. He soon returned to Paris, and in 1506 visited Italy. At Turin he took the degree of D.D. Shortly afterward he applied to the pope for a dispensation from his monastic vows, which was granted. During the course of his journey, he visited Venice, Parma, Rome, and other cities, with his pupil, Alexander Stuart, natural son of James IV. of Scotland. At Rome, the most brilliant prospects were held out to him. Cardinal Grimani, famous lover of learning in that day, offered, out of his admiration for E., to make him 'partaker of his house and fortunes.' Other eminent men vied with Grimani in showing respect

ERASMUS.

to the young scholar, among whom were John de' Medici, afterward Leo X., Cardinal Raphael of St. George, and Giles of Viterbo, general of the Augustines. The pope (Julius II.) also offered him a place among his penitentiaries, an office of considerable consequence, and it would appear, a 'step to the highest preferments in that court.' E., who had always an eye to the main chance, regretted, at a later period of his life, that he had not accepted the offers held out to him in Rome, but meanwhile, having pledged himself to return to England, where also he had many friends, he set out for that country 1509, after the accession of Henry VIII. In several of the cities through which he passed he met friends and patrons, who wished him to settle among them, but as Henry was a correspondent of his, E. was induced to cherish the highest hopes of personal favor from that monarch, and could not be prevailed on to make long stay. He had no sooner arrived in England than he found out his mistake. At first, he lodged with Sir Thomas More, and during his stay with him composed his *Encomium Morie*, or Praise of Folly, the purpose of which is to expose all kinds of fools, but especially those who flourished in the church, not sparing the pope himself. For a short time he filled the office of prof. of Greek at Oxford, but on the whole was very scantily supplied with the means of subsistence. In 1514, he returned disappointed to the continent and resided chiefly at Basel, where he died. E.'s extensive and profound learning was equalled by his refined taste and brilliant wit. A natural love of independence and quiet made him prefer a life of learned leisure and retirement to one of greater publicity; nevertheless, the readiness with which he assumed the character of an adroit man of the world, brought upon him the hostility of many of the nobler spirits of his time. He was no hero, and he knew it. He frankly confesses that 'he had no inclination to die for the sake of the truth.' Luther, in whom the soul and courage of the Apostle Paul seemed to be revived, overwhelmed him with reproaches for his cowardice in regard to the Reformation. But we must not forget that E. by his mental constitution was averse to enthusiasm. He was a scholar and a critic, not a preacher or iconoclast, and he was at least honest enough to abstain from denouncing the opinions of Luther, though he disapproved strongly of his violent language. Besides, there was a tincture of rationalism in the great Dutchman, which probably helped to chill his love of mere Lutheranism. But his services in the cause of science were great and lasting, and his writings are still esteemed for the importance of their subjects, and their classical style. Besides editing several of the ancient authors, and various philological and theological writings, he prepared the earliest edition of the Greek Testament, which appeared at Basel 1516. This is reckoned by some his greatest work. Michaelis says that perhaps there never existed an abler editor of the New Testament, and that E. possessed in the highest degree natural abilities, profound learning, a readiness in detecting errors, with every qualification that is requisite to critical sagacity. His best-known work, however, is his

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Colloquia, a master-piece. Of all his writings this has had the greatest influence. The first edition appeared 1522, but did not please E., who issued a second the same year. A third appeared 1524. This book, which was meant, according to Erasmus, only to make youths better Latinists and better men, was condemned by the Sorbonne, prohibited in France, and burned in Spain. No one who takes up the book will wonder at its condemnation. It contains the most virulent and satirical onslaughts on monks, cloister-life, festivals, pilgrimages, etc., but is disfigured by lewd and unchaste passages wholly inexcusable. The work has been translated into almost all modern languages. His *Encomium Moriw*, or Praise of Folly, already mentioned, was published in the original, with a German translation, and illustrations by Holbein, by W. G. Becker (Basel 1780). E. himself superintended an edition of his works published by Frobenius in Basel. The most complete edition is that of Leclerc (10 vols. Leyden 1603-06). The life of E. has been written in French by Burigny (2 vols. Paris 1758), in German by Müller (Hamburg 1828), and in English by Knight (Cambridge 1726) and Drummond (2 vols. 1873).

ERASTIAN, a. *ĕ-rās'ti-ăn*: pertaining to *Erastus* or his doctrines. ERAS'TIANS, n. plu., those professing the doctrines of *Erastus*, a German divine and physician of the 16th century, who taught that the church ought to be wholly dependent on the state for its government and discipline. ERAS'TIANISM, n. *-izm*, the principles of the Erastians.

ERASTUS, *ĕ-rās'tŭs*, THOMAS: 1524, Sep. 7—1583, Dec. 31; b. Baden, Switzerland: physician and theologian. His real name was *Lieber*, which, according to the fashion of his times, he translated into Greek. In 1540, he went to the Univ. of Basel, where he studied divinity, philosophy, and literature. He subsequently visited Italy, where he betook himself to medicine, and obtained the degree M.D. from the Univ. of Bologna. After nine years, he returned to his own country, and lived at the court of the princes of Henneberg, where he acquired great reputation as a medical practitioner. The elector palatine, Frederick III., invited him to his court, and appointed him first physician and counselor of state. He also conferred on him the chair of physic in the Univ. of Heidelberg. In 1581, he was selected to fill a similar office at Basel, where he died, after establishing a liberal foundation for the provision and education of poor students in medicine, long called the *Erastian foundation*. Among E.'s medical works are *Disputationes de Medicina Nova Philippi Paracelsi* (Basel 1572-3), *Theses de Contagio* (Heidelberg 1574), and *De Occult. Pharmaco. Potestatibus* (Heidelberg 1574). As a physician, E. is creditably characterized by his distrust of abstract and *a priori* theorizing, and his conviction that experimental investigation is the only road to knowledge. But his fame now rests chiefly on what he wrote in ecclesiastical controversy. In his book *De Cœna Domini*, he contended for the figurative interpretation of the passage, 'This is my body,' etc., and supported this view at the conference held at Maul-

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bron between the divines of the Palatinate and those of Wittenberg. But his great work is his *Explicatio Quæstionis Gravissimæ de Excommunicatione*. Although this work was not published till some years after his death, E. had published the same opinions in the form of theses, directed against Gaspar Olevianus, a refugee from Treves, and various other persons, who were anxious to confer on ecclesiastical tribunals the power of punishing vices and misdemeanors. E. denied the right of the church to excommunicate, exclude, absolve, censure—in short, to exercise discipline. Denying ‘the power of the keys,’ he compared a pastor to a prof. of any science, who can merely instruct his students; he held that the ordinances of the gospel should be open and free to all, and that penalties being both in their nature and effect *civil* and not *spiritual*, ought to be inflicted only by the civil magistrate. E. formed no *sect*, neither did he wish to do so. His desire was exactly contrary—viz., to preserve an external harmony at the expense even of the purity of the visible church. He would have let the wheat and tares not only grow together, but also remain entirely undistinguished in the church until the end of the world. Many eminent men, especially in the Church of England, have had similar opinions both before and after E., such as Cranmer, Redmayn, Cox, Whitgift, Lightfoot, Selden, etc. His views had some eloquent adherents in the Westminster Assembly 1643–49; but after a long discussion were rejected with but one dissentient vote. The term Erastian has long been a favorite epithet of reproach among the more rigid Presbyterians in Scotland, but has not been employed with any precision. All persons who deny the power of an established church to alter her own laws without the consent of the state—as, for example, the law of patronage—are generally accused of *Erastianism*, though the principles of E. have literally nothing to do with such a question. An English translation of the *Explicatio* was published 1669, re-edited by Dr. Robert Lee 1845.

ERASURE, or RAZURE: scraping or shaving out of words in a deed or other formal writing. Except in the case of a will, the presumption, in the absence of rebutting evidence, is that the erasure was made at or before execution. *Doe ex dem Tatham v. Gattamore*, 17 L. T. Rep. 74. If an alteration or erasure has been made in any instrument subsequent to its execution, that fact ought to be mentioned (in the Abstract, or epitome of the evidences of ownership), together with the circumstances under which it is done, and more particularly so as a fraudulent alteration by either of those means, if made by the person himself taking under it, would vitiate his interest altogether. It was formerly considered in England that an alteration, erasure, or interlineation (q. v.), would void the whole instrument, even in those cases where it was made by a stranger; but the law in both England and the United States is now otherwise, as it is clearly settled that no alteration made by a stranger will prevent the contents of an instrument from retaining its original effect and operation, where it can be plainly shown what that effect and operation actually was. To accomplish

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this, the mutilated instrument may be given in evidence as far as its contents appear; and intrinsic evidence will be admitted to show what portions have been altered or erased, also the words contained in such altered or erased parts; but if, for want of such evidence, or any deficiency or uncertainty arising out of it, the original contents of the instrument cannot be ascertained, then the old rule would become applicable, or, more correctly speaking, the mutilated instrument would become void for uncertainty.—Hughes' *Practice of Conveyancing*, I. 124, 125. If a will contains any alterations or erasure, the attention of the witnesses ought to be directed to the particular parts in which each alteration occurs, and they ought to place their initials in the margin opposite, before the will is executed, and to notice this having been done by a memorandum, added to the attestation clause at the end of the will (*Id.* p. 945). In Scotland, the rule as to erasure is somewhat stricter; see Menzies's *Lectures on Conveyancing*, p. 124. The Roman rule was, that the alterations should be made by the party himself, and a formal clause was introduced into their deeds to this effect, 'Lituras, inductiones, superinductiones, ipse feci.' As a general rule, alterations with the pen are in all cases to be preferred to erasure; and suspicion will be most effectually removed by not obliterating the words altered so completely as to conceal the nature of the correction. 'The worst kind of deletion,' says Lord Stair, 'is when the words deleted cannot be read (but if they are scored that they can be read, it will appear whether they be *de substantialibus*), for if they cannot be read, they will be esteemed to be such, unless the contrary appear by what precedes and follows, or that there be a marginal note, bearing the deletion, from such a word to such a word, to be of consent.'

ERATO, n. *ēr'ā-tō* [Gr. *Erātō*, one of the Muses—from *erāō*, I love]: the Muse who presided over lyric, and especially amatory, poetry. ERATIVE, a. *ēr'ā-tīvo*, pertaining to the Muse who presided over amatory poetry.

ERATOSTHENES, *ēr-a-tōs'thé-nēz*: eminent Greek writer, called, on account of his varied erudition, the *Philologist*: B.C. 276—B.C. 186; b. Cyrene. Among his teachers were Lysanias the grammarian, and Callimachus the poet. By Ptolemy Energetes, he was called to Alexandria to superintend his great library. Here he died of voluntary starvation, at the age of 80, having become blind, and wearied of life. E. holds eminent rank among ancient astronomers. He measured the obliquity of the ecliptic, and the result at which he arrived—viz., that it was 23° 51' 20"—must be reckoned a very fair observation, considering the age in which he lived. Hipparchus used it, and so did the celebrated astronomer Ptolemy. An astronomical work which goes under the name of E., but which is certainly not his, is extant, called *Katasterismoi*; it contains an account of the constellations, their fabulous history, and the stars in them. It is believed, however, that E. did draw up a catalogue of the fixed stars, amounting to 675; but it is lost. A letter to Ptolemy, king of

ERBIUM—ERCILLA Y ZUÑIGA.

Egypt, on the duplication of the cube, is the only complete writing of his that we possess. E.'s greatest claim to distinction, however, is as a geometer. In his attempt to measure the magnitude of the earth, he introduced the method used at the present day, and found the circumference of the earth to be 252,000 stadia; which, according to Pliny, is 31,500 Roman miles. But as it is not known *what* stadium E. used, it is possible that he came nearer the actual circumference than the above figures indicate. His work on geography must have been of great value in his times: it was the first truly scientific treatise on the subject. E. wrought into an organic whole the scattered information regarding places and countries related in the books of travels, etc., in the Alexandrian library. He wrote also on moral philosophy, history, grammar, etc. His work on the *Old Attic Comedy* appears, from the remains which we possess, to have been a learned and very judicious performance. Such fragments of E.'s writings as are extant have been collected by Bernhardt in his *Eratosthenica* (Berlin 1822).

ERBIUM, n. *ér'bī-ŭm* (symbol E): an element, found with other rare elements, such as ytterbium, scandium, etc., in a few minerals, such as the gadolinite or ytterbite of Sweden. Yttrium, containing E., has been separated as a blackish powder, but E. has never been isolated. The oxide and salts of E. are rose-red.

ERCILLA Y ZUÑIGA, *ěr-thē'yá ē thón-yē'gá*, ALONSO: Spanish poet: b. Madrid, 1533, Aug. 7; date of death unknown. He was the third son of a Spanish jurist, and at an early period became page to the Infanta Don Philip, son of Charles V., accompanying him on his journey through the Netherlands, and some parts of Germany and Italy, and in 1554, to England, on the occasion of the celebration of Philip's nuptials with Queen Mary. Shortly afterward E. went with the army dispatched to America to quell the insurrection of the Auracanian on the coast of Chili. The difficulties with which the Spaniards had to contend, the heroism displayed by the natives in the unequal contest, and the multitude of gallant achievements by which this war was distinguished, suggested to E. the idea of making it the subject of an epic poem. He began his poem on the spot, about 1558, occasionally committing his verses, in the absence of paper, to pieces of leather. An unfounded suspicion of his having plotted an insurrection involved him in a painful trial, and he had actually ascended the scaffold before his innocence was proved. Deeply wounded, the brave soldier and poet turned to Spain, but Philip treating him with great coldness and neglect, E. made a tour through France, Italy, Germany, Bohemia, and Hungary. For some time he held the office of chamberlain to the emperor Rudolf II., but 1580 returned to Madrid, where the latter years of his life were spent in obscurity and poverty. He died at Madrid. His historic epos, written in the octo-syllabic measure, and entitled *Araucana*, is, with the exception of a few episodes,

ERCINITE -ERCKMANN-CHATRIAN.

a faithful description of actual events. Cervantes, in his *Don Quixote*, compares it with the best Italian epics, and it has undoubtedly not a little of the epic style and spirit. Of its three parts, the first is the freshest in character, having been completed before the author's return to Europe, where it was published separately (Madrid 1569). In Spain, and other countries, many reprints of the poem appeared, notably in 1776, 1828, 1851. A German translation was published by Winterling (1831), and a complete French one by Nicolas (1870). See Royer's *Étude sur l'Araucana de E.* (1880).

ERCINITE, n. *er'sin-īt* [from *Sylva Hercynia*, Roman name for the Harz Mountains, in which it was found at Andreasberg]: in *min.*, the same as HARMOTOME (q.v.).

ERCKMANN-CHATRIAN, *ēr'k'mān, shā-trē-ōng'* (EMILE ERCKMANN and ALEXANDRE CHATRIAN): two French men of letters. Erckmann was born Phalsbourg, 1822, May 20. Chatrian was b. in the village of Soldaten-thal 1826, and died 1890, Sep. 4. Both were born in what was then the French dept. of Meurthe, now reunited to Germany as part of the imperial territory of Alsace-Lorraine. E., the son of a bookseller, went through a rather irregular course of study at the college of his native town, went to Paris 1842 to study law, which he broke off several times, and only passed his third examination 1857, and finally abandoned the study in the following year. During the interval, he had set himself to make a name in literature, in co-operation with M. Chatrian. The latter, belonging to an old family of glass-makers in Meurthe, ruined by reverses in trade, was acting as tutor at the college of Phalsbourg, when, 1847, he was introduced to M. Erckmann. From that time the two friends employed their pens in the same works till a temporary break in collaboration 1889; and it was only about 1863 that the authors informed their readers that the numerous works of fiction, which had obtained a widespread popularity, and were supposed by the general public to be the work of a single writer, were the fruits of their friendly collaboration. Their early works attracted comparatively little notice; and it is said that their first work was rejected by all the newspapers of Paris, and by many provincial journals. In 1848 they published several feuilletons in the *Démocrate du Rhin*, which had just been started: *Le Sacrifice d'Abraham*, *Le Bourgmestre en Bouteille*, etc., which they have since published separately. At the same time they wrote a drama, *Le Chasseur des Ruines*, for the Ambigu-Comique, which the theatre accepted, subject to changes, which they refused to make. They produced another drama, *L'Alsace en 1814*, for the theatre of Strasbourg, which was suppressed by the prefect on the second representation. They wrote numerous novels at this time for different journals, some of which were very little noticed, while others remained in MS. for years. Despairing of being able to live by their pens, E. recommenced his law studies, and C. obtained a situation in the office of the Eastern railway. It

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was not till 1859 that *L'Illustré Docteur Mathéus* (1859; 3d ed. 1864), published by the Librairie-Nouvelle, gave a certain éclat to the collective name of Erckmann-Chatrian. *Le Fou Yégof* (1862) is one of a series of novels, the subjects of which are taken from their national history, and gives a picture of the invasion of 1814. *Le Conscrit de 1813* (1864) and *Waterloo* (1865) are fragments of an autobiography, and are supposed to be the recollections of a common soldier, and relate the disastrous campaigns of 1813-14. These may be called the gems of their collection. *Le Joueur de Clarinette* (1863), a simple story of a village musician, and *Les Amoureux de Catherine*, another tale of village life in the same volume, are nearly perfect. *L'Homme du Peuple* appeared 1865, and is less favorably spoken of as a work of art. It pictures the life of the modern French workman. In 1866 appeared *La Maison Forestière* and *La Guerre*; in 1867, *Le Blocus*, which has been translated under the title *The Blockade of Phalsbourg*; a historical romance 1868, *Histoire d'un Paysan*; 1869, *Le Juif Polonais*, a play. In 1889, a serious quarrel occurred between the two authors concerning a division of profits, and for a time they were entirely estranged; but before the death of Chatrian they were reconciled. Afterward Erckmann wrote several stories, among them being *Kaleb et Khora* and *La Première Campagne du Grand-père Jacques*.

ERDMANNITE, *n.* *ēr'd-man-īt* [named after Prof. Erdmann]: in *mineral.*, name of two minerals; *Erdmannite of Berlin*, a variety of orthite; *Erdmannite of Esmark*; a variety of zircon.

ERE, conj and prep. *ār* [Goth. *air*, early; AS. *ær*, early, before; Dut. *eer*, sooner; Ger. *eh̄er*, before; *erste*, first]: before; sooner than. **ERST**, ad. *ērst*, at first; in early times; once; long ago. **ERE LONG**, ad. *ār' lōng*, a contraction for 'before long time,' or 'before a long time shall elapse.' **ERE NOW**, ad. before this time. **EREWHILE**, a. ad. *ār-hwīl*, some time ago; a little while before.

EREBUS, *n.* *ēr'ē-būs* [L in *anc. myth.*, the god of darkness, son of Chaos, and brother of Nox]: darkness; the region of the dead; hell; it denotes especially the gloomy cavern beneath the earth through which the shades of the dead were supposed to pass to Hades.

EREBUS, *ēr'ē-būs*, **MOUNT**, and **MOUNT TERROR**: volcanoes discovered by Sir James Ross while exploring Victoria Land, then supposed to be an antarctic continent, 1841, Jan., and named after the ships of his expedition; lat. $77\frac{1}{2}^{\circ}$ s. and long. $168^{\circ} 12'$ e. Mt. E. is 12,400 ft. high and was emitting flame and smoke when discovered, and Mt. T. is 10,900 ft. high, and inactive.

ERECHTHEUS, *ēr-rēk'thūs*, or **ERICHTHONIUS**, *ēr-īk-thō'-nī-ūs*: mythical Attic hero, said to have been the son of Hephaestus and the Earth, and to have been reared by Athena. One form of the tradition states that when a child he was placed by Athena in a chest, which was intrusted to Agrauios, Pandrosos, and Herse, daughters of Cecrops, with the strict charge that it was not to be

ERECT—EREGLI.

opened. Ágraulos and Herse, however, unable to restrain their curiosity, opened the chest, and discovering a child entwined with serpents, they were seized with madness, and threw themselves down the most precipitous part of the Acropolis. Afterward Erechtheus was the chief means of establishing the worship of Athena in Attica. He is regarded as the founder of the Erechtheum, the temple of Athena Polias, guardian of the city.

This original ERECHTHEUM, which contained Erechtheus's tomb, and was called by his name, was burned by the Persians, but a new and magnificent temple was raised on the same site—north of the Parthenon, and near the n. wall of the Acropolis—in the beginning of B.C. 4th. c. The second Erechtheum was a splendid structure of the Ionic order, oblong, extending from e. to w., abutting in side chambers at the w. end, toward the n. and s., and having porticoes adorned with columns at its e., n., and s. extremities. It is now an utter ruin.

ERECT, v. *ě-rěkt'* [L. *erectus*, raised or set up—from *e*, out of; *rectus*, straight or upright]: to raise; to set up; to build; to found or establish: ADJ. in a perpendicular position; upright; firm; unshakèn, or bold. ERECTING, imp. ERECTED, pp. ERECTLY, ad. *-lì*, in an upright position. ERECTNESS, n. the being perpendicular in position or form. ERECTABLE, a. *-tì-bl*, that can be erected. ERECTILE, a. *-tìl*, that which may be erected; having the property of raising itself. ERECTIVE, a. *-tìv*, able or tending to erect. ERECTER, n. *-těr*, one who. ERECTOR, n. *-ter*, a muscle that erects; he or that which erects. ERECTION, n. *-shűn* [F.—L.]: the act of raising or building; settlement or formation; a building of any kind.—SYN. of 'erect, v.': to establish; found; elevate; construct; institute; lift up; set up; exalt; form; make.

ERECTION, LORDS OF: those of the nobility in Scotland to whom the king, after the Reformation, granted lands, or tithes, which formerly belonged to the church. They were called also Titulars of Tithes; the gifts being not confined to the nobility. The grants were made under the burden of providing competent stipends to the reformed clergy—an obligation very little attended to by the grantees, prior to the decrees arbitral of Charles I., 1629. Ersk. B. ii. tit. 10, s. 18.

EREGLI, *ě'r'ěg-lě*, or EREKLİ, *ě'r'ěk-lě* (anc. *Heraclea*): town of Asia Minor on the Black Sea, 128 m. e.n.e. of Constantinople, lat. 41° 15' 30" n., long. 31° 28' e., where Xenophon's army embarked on their return to Greece. It has a commodious harbor, large ship-building yards, and valuable coal interests, exports coal, timber, silk, and wax, and imports colonial produce, tobacco, and iron. Pop. 5,000.—EREGLI (anc. *Archalla*) is the name also of a town of Asiatic Turkey, 90 m. e.s.e. of Konieh, in the vilayet of the same name.—EREGLI (anc. *Perinthus*) is the name also of a town of Roumelia, European Turkey, on the Sea of Marmora, 55 m. w. of Constantinople; see of a Greek bishop.

EREMACAUŠIS—ERFURT.

EREMACAUŠIS, n. *ēr'ě-mă-kau'sis* [Gr. *erēmă*, silent, gentle; *kaušis*, a burning]: the slow chemical change or combustion without sensible heat, caused by the action of the oxygen of the atmosphere on moist animal or vegetable bodies, as in the slow decay of wood. The process consists in the oxygen (O) of the air combining with the hydrogen (H) of the wood forming water (HO), and in less quantity with the carbon (C) forming carbonic acid (CO₂), leaving a brown mold or powder, called by chemists ulmin, or humus, in which carbon preponderates.

EREMITE, n. *ēr'ě-mit*: another spelling of **HERMIT**, which see.

EREMITE, n. *ēr'ě-mīt* [Gr. *erēmos*, lonely, in allusion to its rarity]: in *mineral.*, the same as **MONAZITE** (q. v.).

EREMUS, n. *ēr'ě-mūs* [Gr. *erēmos*, solitary]: in *bot.*, a ripe carpel partially detached from the rest.

ERETHISM, n. *ēr'ě-thīzm* [Gr. *erēthismos*, irritation]: in *med.*, a state of irritation or excitement of a part, different from, or short of, the inflammatory condition, although often passing into it; unnatural energy of action. **ERETHISTIC**, a. *-thīst'ik*, pertaining or relating to erethism.

ERETHIZON, n. *ēr-ě-thīz'on* [Gr. *erethizōn*, pp. of *erethizō*, I rouse, I fight]: in *zool.*, genus of *Cercolabidæ*, a family akin to the *Hystericidæ*. *Erethizon dorsata* is the Canadian porcupine.

ERETRIA, *ēr-ě-trī-a*: ancient city of Greece, on the w coast of the island of Eubœa, a few miles s.e. of Chalcis, with which it maintained a commercial rivalry many years. It was a rich and powerful city previous to the Trojan war, and was destroyed by the Persians for having assisted the Ionic cities in their revolt, B.C. 490. It was rebuilt s.e. of its old site, named New E., took an important part in the Peloponnesian war, and contained a famous school of philosophy.

ERF, n. *erf*, **ERVEN**, n. plu. *ēr'ven* [Dut.]: garden plot, usually containing about half an acre.

ERFURT, *ēr'fart*: city of Prussian Saxony, anciently cap. of Thuringia; in a highly cultivated plain. on the right bank of the Gera, 14 m. w. of Weimar. Till 1873 E was strongly fortified, and was accounted a fortress of the second rank. Its two citadels, the Petersberg and the Cyriaksburg, were formerly monasteries. Among the numerous churches, the cathedral and the Church of St Severus are the finest. The cathedral is one of the most venerable Gothic buildings in Germany, and possesses, besides a very rich portal, sculptures dating from the 11th to the 16th c. Of the convents, only that of the Ursuline nuns remains. The monastery of St. Augustine, famous as the residence of Luther, whose cell was destroyed by fire 1872, was converted 1820 into an asylum for deserted children. The other remarkable buildings are, the university, founded 1378, suppressed 1816; the royal acad.; the library, containing 60,000 vols.; numerous educational establishments, infirmaries, etc. Horticulture and extensive trade in seeds

ERG—ERGOT.

are carried on. The principal manufactures are woolen, silk, cotton, and linen goods, yarn, shoes, stockings, tobacco, leather, etc.

E. is said to have been founded in the beginning of the 5th c. by one Erpes, from whom it took its original name of Erpesford. During the middle ages, at the time of its highest prosperity, E. was strongly fortified, and contained 60,000 inhabitants. In 740, St. Boniface founded a bishopric at E.; and in 805 it was converted into an entrepôt of commerce by Charlemagne. It afterward belonged to the Hanse-league, then to the elector of Mainz, from 1801–06 to Prussia, and from that time till 1813 it was under French rule. E. was finally restored to Prussia by the Congress of Vienna. In the spring of 1850, the parliament of the states, which had combined together for union, held its sittings at Erfurt.—Pop. (1885) 58,385; (1890) 72,360.

ERG: see ELECTRICAL UNITS.

ERGASILIDÆ, n. *ēr-gc-sīl'ī-dē*: family of crustaceans, placed under Milne Edwards's order *Siphonostomata*, now *Epizoa* or *Parasita*. Most of the species are parasitic on the gills of fishes, one on those of the lobster. ERGASIL'US, n. -ūs [Gr. *ergasia*, work; daily labor]: genus of crustaceans, typical one of the family *Ergasilidæ*.

ERGO, conj. *ēr'gō* [L.]: therefore; consequently; often used in a jocular way.

ERGON, n. *ēr'gon*: occurs in composition, as *ergon*-eight.

ERGOT, n. *ēr'gōt* [F. *ergot*, cock's spur]: diseased condition of the germen of grasses, sometimes observed also in some of the *Cyperaceæ*. It begins to show itself when the germen is young; different parts of the flower assume a mildewed appearance, and become covered with a white coating composed of a multitude of minute spore-like bodies mixed with delicate cobweb-like filaments; a sweet fluid, at first limpid, afterwards viscid and yellowish, is exuded; the anthers and stigmas become cemented together; the ovule swells till it greatly exceeds the size of the proper seed, bursts its integuments, and becomes elongated and frequently curved, often carries on its apex a cap formed of the agglutinated anthers and stigmas, and assumes a gray, brown, purple, violet, and at length a black color, as the viscid exudation dries and hardens. The structure differs very much from that of the properly developed seed; the qualities are not less different, almost one-half of the whole substance consists of *fungin*; and the cells contain, instead of starch, globules of a peculiar fixed oil—OIL OF ERGOT, to which the remarkable qualities of ergot are supposed to be chiefly or entirely due. Oil of ergot forms about 35 per cent. of the ergot of rye. Ergot appears to have been observed first in rye, in which it becomes very conspicuous from the large size it attains, sometimes an inch or even an inch and a half in length. It is, however, not uncommon in wheat and barley, though in them it is not so conspicuous, from its general resemblance to the

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ordinary ripened grain. Rye-grass is often affected with ergot, as are many other grasses; and it is of frequent occurrence in maize, in which



Ergot of Rye.

also it attains its greatest size. Ergot has been supposed to be merely a disease occasioned by wet seasons or other climatic causes. But it appears now to be ascertained that it is a disease occasioned by the presence of the *mycelium* of a fungus; the spores of which may perhaps be carried to the flower through the juices of the plant, for there is reason to think that ergot in a field of grain may be produced by infected seed. Mr. Quekett, 1838, described a fungus, a kind of MOLD (q. v.), which he found in ergot, and to which he gave the name of *Ergotætia abortificiens*. Link and Berkeley afterwards referred it to the genus *Oidium*; and they, as well as others, believed it to be the

true ergot fungus. The spores of this ergot mold, however, vegetate readily, under proper conditions of warmth and moisture, in situations very different from that in which ergot is produced; and its presence is perhaps a consequence rather than the cause of ergot. The true ergot fungus seems to have been discovered by Tulasne, who published a description of it 1853. That of the ergot of rye is called *Cordiceps* (or *Claviceps*) *purpurea*; its mycelium alone exists in ergot, but if the ergoted grains are sown, the fungus develops itself in its perfect form, growing in little tufts from the surface of the ergot, with stem about half an inch long, and subglobular head. Allied species appear to produce the ergot of other grasses.

Ergot is inflammable, burning with a yellow-white flame; the fixed oil which it contains, indeed, makes it burn readily if brought into contact with the flame of a candle. It is a valuable medicine, exercising a specific action on the womb, particularly during labor, and by the greater frequency and force of the contractions which it causes when cautiously administered, often most beneficially hastening delivery. This use of it is said to have originated—probably through accidental discovery—with a provincial female practitioner in France. Its introduction into British practice dates only from 1824. It is the ergot of rye which is always employed; also called SPURRED RYE, or *Secale cornutum*. It has been employed also as a sedative of the circulation, to check various kinds of hemorrhage. Ergot is administered in various forms—powder, decoction, extract, tincture, oil of ergot, etc. —In

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large or frequent doses, ergot is a poison, sometimes producing convulsions, followed by death; sometimes gangrene of the extremities, resulting in mutilation or in death. Ergot of rye consists of 35 per cent of a peculiar fixed oil, $1\frac{1}{2}$ of ergotin, 46 of fungin, the remainder being gum, fat, albumen, salts, etc. Ergot treated with water yields a reddish-colored liquid with acid properties. In considerable quantities, it is a poison to the lower animals as well as to man. ER'GOTISM, n. -gō-tizm, in *med.*, a diseased state of body caused by eating diseased or unripe grain, especially the poisonous effects resulting from eating bread made from spurred rye (see RAPHANIA). ER'GOTIZED, a. -tizd, diseased by ergot, as rye. ER'GOTIN, n. -tĭn, the acrid, bitter, active principle of ergot.

ERHARDT, ěr'hárt, JOEL B.: b. Pottstown, Penn., 1838; lawyer. He removed with his parents to New York when four years old, attended the public schools, was a clerk several years, studied law, and entered the Univ. of Vt. In 1861, Apr., he left the univ., enlisted in the 7th N. Y. regt., and served with it during its term, and on returning to New York was admitted to the bar. Shortly afterward he enlisted in the 1st Vt. cav., became capt., and resigned 1863. He was provost marshal of the 4th cong. dist., N. Y., 1863, Apr. 15-1865, May 1, and was then appointed asst. U. S. dist. atty. In 1876 he was appointed a police commissioner of New York. Mayor Ely preferred charges against E. and two other commissioners, on which they were tried but not removed. In 1879 other charges were preferred against him by a fellow-commissioner, and on the accession of Mayor Cooper he preferred charges against all the commissioners for mismanagement and incompetency. A long trial followed, but while the certificates of removal were awaiting Gov. Robinson's signature, a successor to E. was confirmed. In 1888, Nov., he was defeated as republican candidate for mayor of New York, and 1889, Apr., was appointed by Pres. Harrison collector of the port of New York. Though under repeated attack in the fierce political contests of New York, E. has high repute for integrity and executive ability. He resigned the collectorship 1891.

ERIAN, a. ěr'ĭ-an: in *geog.* and *geol.*, pertaining to Lake Erie.

ERIC.

ERIC, *Er'ik*: Scandinavian form of the name Henricus, Enrico, and Henry of southern nations. Many kings of the name reigned separately in Denmark and Sweden, and some ruled over the whole of Scandinavia after the union of Calmar. The two earliest rulers of the name in Denmark merit notice from their association with the introduction of Christianity.

ERIC I. (died 860) protected the Christians in the latter part of his reign, and, under the direction of the missionary Ansgar (q. v.) or Anscharius, founded the cathedral of Ribe, the first Christian church in the land. In his time the Northmen began those incursions into southern countries which were destined to exercise so permanent an influence on European history.

ERIC II. followed in the steps of his father, and permitted Ansgar to prosecute the labor of converting and civilizing the people, which won for him the title of the Tutelar Saint of the North. To Eric II. is ascribed the reorganization of those guilds which finally merged in the municipal corporations of the middle ages, but which were, at first, a mere modification of the heathen brotherhoods of the Scandinavian heroic ages, and constituted associations, whose members were a privileged class, separated by distinct laws, rights, and duties from the rest of the people.

In the 12th c. Denmark suffered in an equal degree from the two Erics who ruled over her, for while **ERIC**, surnamed Emun, exhausted the strength of the land by the indomitable pertinacity with which he endeavored, by force of arms, to compel the Vandals and other piratical neighbors to accept the Christianity which he thrust upon them, **ERIC** 'the Lamb' crippled the powers and resources of the crown by his pusillanimous subserviency to the clergy.

The three Erics (**ERIC VI.**, **VII.**, and **VIII.**) who occupied the throne 1241-1310, with only the intermission of a few years, are associated with one of the most disastrous periods of Danish history. Long minorities, the suicidal practice of dismembering the crown-lands in favor of younger branches of the royal house, and futile attempts to restrain the ever-increasing encroachments of the church, combined to bring the country to the brink of destruction. **Eric VI.** (Plogpenning) and **Eric VII.** (Glipping) were both assassinated, the former at the instigation of a brother, and the latter in revenge for a private injury. **Eric VIII.**, last of the name before the union of Calmar, died childless, and was succeeded, 1319, by his ambitious brother Christopher, who saw himself compelled to repay his partisans at the expense of almost all the prerogatives and appanages which still belonged to the crown.

In *Sweden*, the first of the name who merits notice is King **ERIC**, surnamed the Saint, slain in battle 1161, after a short reign, which was signalized, in that age of anarchy, by the foundation of many churches and monasteries, and by the promulgation of an excellent code of laws, known as *St. Eric's Lag*. This law contained provisions by which a higher status in society was secured to women, by granting them a fixed proportion of the heritage of their male rela-

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tives, and certain definite privileges within their households. St. Eric waged frequent war with the Finns, and compelled them to adopt the outward forms of Christianity. The two namesakes and descendants of St. Eric, who ruled in Sweden during the 13th c., and ERIC XII. (reigned 1350-59), have little claim to notice, for internal disturbances and wars with their neighbors brought about the same fatal results as those associated with the reigns of the Erics in Denmark during the middle ages.

In 1412, on the death of the great Margaret, her relative, ERIC of Pomerania, succeeded to the triple crown of Scandinavia, in accordance with the articles of the famous treaty of Calmar. The noble heritage that had been bequeathed to Eric required a firmer hand and a braver spirit than his to keep it in check; and his reckless disregard of treaties and oaths, his neglect of his duties, and his misdirected ambition, led, after years of dissensions, maladministration, and disaffection, to the inevitable result that Eric was declared to have forfeited the respective thrones of the several kingdoms, which proceeded to elect rulers of their own. The intestine wars which then arose plunged the whole of Scandinavia into anarchy, and sowed seeds of dissension among the three kindred nations, which bore fatal fruits in subsequent ages. The last ten years of Eric's life were spent in piracy in the island of Gothland, whither he had retired with his mistress and a band of followers, and whence he sent forth piratical expeditions to pillage both friends and foes. Eric married Philippa, daughter of Henry IV. of England, whose memory is still cherished in the north, on account of the many noble deeds with which local tradition associates her name.

ERIC XIV., the last of the name who reigned in Sweden, had the distinction of being at once one of the worst and one of the most unhappy of the name. He succeeded, 1560, to the throne of his father, Gustaf Vasa, perhaps the greatest and worthiest monarch that ever reigned over Sweden, and immediately on his accession he made known the difference that was so unfavorably to distinguish his reign from that of his father, by quarrelling with his brothers, thwarting the nobles, and opposing the lower orders. His fickleness and extravagance were evinced in a succession of embassies, which were in turn sent to almost every European court, to demand a consort for this vacillating monarch, who usually changed his mind before his envoys had time to fulfil their missions. Elizabeth of England and Mary of Scotland were more than once the objects of his matrimonial schemes; but when the resources of the country had been seriously crippled by these costly and absurd expeditions, Eric married a Swedish peasant-girl, who ultimately acquired an influence over him ascribed by the superstitious to witchcraft, since she alone was able to control him in his violent paroxysms of blind fury. It is probable that Eric labored under remittent attacks of insanity, and that to this may be attributed the bloodthirsty cruelty with which he persecuted those of his own relatives or attendants who fell under his suspicion. His capricious cruelties at length alienated the minds of his

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Subjects, who, wearied with the continuous wars and disturbances in which his evil passions involved them, threw off their allegiance 1568, and solemnly elected his brother John to the throne. For nine years the unhappy Eric suffered every indignity at the hands of the keepers appointed by his brother to guard him, and in 1577 he was compelled to terminate his miserable existence by swallowing poison, in obedience to his brother's orders. Strange to say, this half madman was a person of cultivated understanding, and he solaced his captivity with music and the composition of psalms, and in keeping a voluminous journal.

ERIC, *ēr'ik*, THE RED: viking; one of the adventurous Norsemen who settled on the bleak shores of Iceland in 982: son of the Jarl (Eng. Earl) of Jadar: he was named from the color of his hair. He was soon in search of further adventure. Many years before, Gunnbjörn said that he had seen land to the west. Eric determined to take possession of it; and 983, with a party of daring followers, he started from Bredfiord in Iceland, sailed round Cape Farewell, and up the w. coast of the great peninsula or island, to which he gave the name Greenland. To-day the name seems a misnomer; but Eric saw herds of reindeer feeding in meadows, where Julianeshaab now stands. There Eric settled, calling the inlet Ericfiord. He returned to Iceland 985 to enlist fresh adventurers, and then succeeded in reaching Ericfiord with 14 vessels out of a fleet of 25, and built a town several miles up the fiord. The settlement flourished, and colonized several points along the coast. The climate at that time must have been milder, for the chronicles mention trees, and seldom allude to ice.—LEIF ERICSON, son of Eric the Red, was sent out by his father about the year 1000, in charge of an exploring expedition, and discovered the N. American continent, naming one place Markland, which has not been fully identified, but possibly was Nova Scotia; and another part Vinland, from the vines there growing wild, which was probably the s.e. part of New England. He is said to have planted a colony at the latter point, but the evidence has been much disputed. See, on the whole question, Laing's *Heimskringla*.

ERICA, n. *ēr-i'kă* [L. *ericæus*, of heath or broom—from *erīcē*, heath]: a genus of beautiful and interesting plants, ord. *Ericacææ*, or heath family, mostly natives of Cape of Good Hope.

ERICALES, n. *ēr-i-kă'lēz* [mod. L. *erica*]: in bot., alliance of hypogynous exogens with dichlamydeous flowers, symmetrical in the ovary, axile placentæ, definite stamens, and embryo inclosed in a large quantity of fleshy albumen. Lindley includes under it five orders, *Humiriaceæ*, *Epacridaceæ*, *Pyrolaceæ*, *Francoaceæ*, *Monotropaceæ*, and *Ericaceæ*.

ERICEÆ.

ERICEÆ, ē-rī'sē-ē, or ERICACEÆ, ěr-ĭ-kā'sē-ē: nat. ord. of exogenous plants, consisting chiefly of small shrubs, but containing also some trees. The leaves are opposite or in whorls, entire, destitute of stipules, often small, generally evergreen and rigid. The flowers are sometimes solitary in the axils of the leaves, sometimes grouped in different modes of inflorescence, and are often of great beauty, in which respect no order of plants excels this; the beauty of the smallest species, and of those which have very small flowers, rivalling that of others which are trees profusely covered with magnificent clusters. About 900 species of this order are known, of which the greater number are natives of s. Africa, which particularly abounds in the genus *Erica*, and its allies—the true heaths (q. v.)—though some of them are found also at the utmost limits of northern vegetation. They are rare within the tropics, and occur only at considerable elevations. Few species are found in Australia. Many of the E. are *social* plants, and a single species sometimes covers great tracts, constituting the principal vegetation. This is most strikingly exemplified in the heaths of Europe and the n. of Asia. Medicinal properties exist in some of the E., as the BEARBERRY (see ARBUTUS), and the GROUND LAUREL, of N. America (*Epigæa repens*), (see EPIGÆA REPENS), a popular remedy in the United States for affections of the bowels and urinary organs. Narcotic and poisonous qualities are frequent. See ANDROMEDA: AZALEA: KALMIA: LEDUM: RHODODENDRON. The berries of some species are edible (see ARBUTUS: GAULTHERIA), though none are much esteemed.—The RHODODENDREÆ, classed sometimes as an order, are classed usually as a sub-order of E., containing genera *Rhododendron*, *Azalea*, *Kalmia*, *Ledum*, etc.: to it belong generally the larger plants of the order, also many small shrubs of sub-arctic regions.

ERICHSEN—ERICSSON.

ERICHSEN, *ēr'ik-sën*, JOHN ERIC, M.D., F.R.S., LL.D.: eminent English surgeon and author; b. London, 1818. He was educated at the Mansion House, Hammersmith, and at University College, London; was appointed sec. to the physiological section of the British Assoc. for the Advancement of Science 1844; took the Royal Humane Society's gold medal with an essay on *Experimental Inquiry into the Nature and Treatment of Asphyxia* 1845; was appointed prof. of surgery and of clinical surgery in University College and surgeon to the hospital 1850; was a member of the royal commission on vivisection 1875; was pres. of the surgical section of the great international medical congress 1881; and was the unsuccessful candidate for parliament from the universities of Edinburgh and St. Andrew's 1885. He has been pres. of the Royal College of Surgeons of England and of the Royal Medical and Chirurgical Soc., is surgeon-extraordinary to Queen Victoria, and is a member of the principal surgical and scientific societies of the world. His *Science and Art of Surgery* has been translated into almost every known language.

ERICHT, *ēr'icht* (or *ER'ROCHT*), LOCH: in the n.w. of Perthshire and s. of Inverness-shire, in an uninhabited district, the wildest and most inaccessible in Scotland, amid the Grampian Mountains. Its banks rise steeply from the water's edge. It is 14 m. long, nearly a mile broad, and extends s.w. from near Dalwhinnie, on the Dunkeld and Inverness road. By one outlet it joins Loch Rannoch, and by another it runs into Loch Lydoch, its waters ultimately reaching the Tay. It is about 1,500 ft. above the sea, and it never freezes. In a cave at the s. end of the loch, Prince Charles lay hid 1746.

ERICHTHIANS, n. *ēr-ik'thī-anz* [Gr. *erion*, wool; *ichthus*, fish]: English name for the tribe of unicuirassiated stomapod crustaceans, the type of which is *Erichthys*. **ERICHTHYS**, n. *-thīs*, genus of stomapoda. It contains the glass shrimps.

ERICINONE, n. *ēr-ī'sī-nōn* [L. *erica*; Eng. *quinone*]: in *chem.*, crystalline substance obtained by the dry distillation of ericaceous plants. It has been found identical with hydroquinone, $C_6H_4(OH)_2$ (1.4): see **HYDROQUINONE**.

ERICSSON, *ēr'ik-son*, JOHN, LL.D.: 1803, July 31—1889, Mar. 8; b. Langbanshyttan, Sweden: engineer. He studied some time with a German officer of engineers; spent most of his time examining the machinery in his father's mines; was appointed a cadet in the corps of mechanical engineers when 12 years old, and a leveller on the great Swedish ship canal when 13; entered the army as ensign 1820; was promoted capt. 1827; and soon afterward resigned. His early inventions included a condensing-flame engine, a line-engraving machine, an instrument for sea-soundings, a hydrostatic weighing-machine, a tubular steam-boiler, and artificial draught by centrifugal blowers. He built the locomotive *Novelty* to compete with George Stephenson's *Rocket*, and invented and built a steam fire-engine 1829; introduced link motion for reversing loco-

mōtives 1830; perfected the famous caloric engine 1833, and built a vessel of 2,000 tons and propelled it with this motor 1853; invented the screw-propeller, which revolutionized steam navigation, 1836; came to the United States 1839; and designed the screw-propelled war vessel, *Princeton*, with machinery below the water line 1841. Much of the machinery and all its arrangement were designed by him, and he also introduced numerous mechanical novelties and a 12-inch wrought-iron gun, with a similar carriage, which took up the recoil without breeching. He received the prize medal of the world's fair, London, for a variety of philosophical devices 1851; offered Napoleon III. the plans for a partially submerged iron-clad, revolving-turret war vessel 1854; and built for the U. S. govt., in 100 days, the little iron-clad *Monitor*, which defeated the Confederate iron-clad *Merrimac* in Hampton Roads 1862, Mar. 9. This vessel led to an immediate and radical revolution in the navies of the world. See TURRET-SHIP. In 1869 he built a large fleet of steam gun-boats for the Spanish govt., with which to guard Cuba; 1881 devised the war vessel *Destroyer* and her 16-inch submarine gun; and 1883 presented to the public as a contribution to applied science a device for obtaining steady power from the sun. He received his degree from Wesleyan Univ. 1862. Amid a great naval pageant in New York harbor, ordered by the U. S. govt., his remains were placed on board the new U. S. cruiser *Baltimore* 1890, Aug. 23, for transportation to Sweden, where they were received and interred with equally impressive public ceremonies.

ERIDANUS, n. *ē-rid'ă-nŭs* [Gr. *Eridānōs*, the river Po]: a winding constellation in the southern hemisphere.

ERIE, *ē'ri*: city, cap. of E. co., Penn.; on Lake Erie, between Buffalo and Cleveland; on the Lake Shore railroad; at terminus of the Philadelphia and E. and the E. and Pittsburg railroads; 117 m. n. of Pittsburg. E. is on a bluff, having a grand view of the lake, is laid out with broad streets at right angles with each other, and has several large and attractive parks. It is lighted with gas and electricity, and has a bountiful supply of water forced from the lake to the top of a tower 200 ft. high, and thence distributed through the city; cost \$750,000. The peculiarly advantageous location of E. has given it high rank as a shipping and manufacturing point. It is in the small part of the state that touches the lake, and it has the largest land-locked harbor on Lake E. The harbor has been greatly improved by the federal govt., and is now 5 m. long by 1 m. wide, depth 9 to 25 ft. Presque Isle, lying directly in front of the city, furnishes the means of ample protection. Two light-houses stand at the entrance to the harbor; and substantial wharves, where merchandise is transferred directly from vessels to cars, extend along the entire front. In 1890, there were 236 manufacturing establishments, employing \$12,812,594 in capital, 7,029 hands, paying \$3,828,438 in wages, and yielding products valued at \$12,765,768. The principal industries are manufactures

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of iron, including steam-engines, machinery, car-wheels, car work and stoves, representing \$2,291,529 in annual value of products; flour and grist mill products valued at \$809,800 annually; beside brick, leather, organ, pump, furniture, and various kinds of wood-work factories, 6 petroleum refineries, 5 beer breweries, 2 ale breweries, and 3 malt houses. Leading articles of shipment are lumber, bituminous and semi-bituminous coal, iron ore, petroleum, and manufacturing products, and these are conveyed by railroad cars, steamboats, and sailing vessels that ply regularly between E. and other ports on the great lakes. There are four national banks, cap. \$850,000; 1 state bank, cap. \$85,000, and 1 private bank. The city is divided into 6 wards, and governed by a mayor, a select council, and a common council. Its educational system includes a high school and over 50 grammar, primary, and evening schools. There are 30 churches, divided denominationally as follows: Rom. Cath.; 7; Presb., 5; Meth. Episc., 4; Prot. Episc., 3 (and 1 mission); German Evang., Lutheran, and Bapt., each 2, the latter with 3 missions; and Jews, Evang. Lutheran, and Ref., German Evang. Lutheran, Unit. Breth., and Universalist, each 1. E. is the see of a Rom. Cath. bp., who has under his control St. Joseph's orphan asylum, St. Vincent's hospital, a Benedictine priory, St. Benedict's convent and St. Benedict's (female) Acad. The Young Men's Christian Assoc. is an active organization, with a library of over 5,000 vols. The public buildings include a custom house, marine hospital, city hospital, and jail. On the site of E. the French built a fort prior to 1749, known as Fort de la Presque Isle. A town was laid out 1795, a portion incorporated as a borough 1805, and the whole granted a city charter 1851. The fleet with which Com. Perry won his great victory on Lake E. during the war of 1812-15 was built and fitted out at E. Pop. (1860) 9,419; (1870) 19,646; (1880) 27,737; (1890) 40,634.

ERIE, BATTLE OF LAKE: naval conflict, 1813, Sep. 10, between the United States and Great Britain near the Bass islands, at the w. extremity of the lake, 36 m. e. of Toledo. In the early part of the war Lieut. Oliver Hazard Perry, U.S.N., was placed in command of the American forces on the lake, with instructions to fit out a squadron of 9 vessels, for the maintenance of the naval supremacy of all the lakes. He built and equipped at Erie, Penn., the *Lawrence*, *Niagara*, *Caledonia*, *Scorpion*, *Ariel*, *Somers*, *Porcupine*, *Tigress*, and *Trippe*, having a total of 54 guns and 490 officers and men. Though Erie was blockaded by the British fleet at the time, Perry succeeded in getting egress for all his vessels, and proceeded to Put-in-Bay, near Sandusky. On Sep. 10 he discovered a British fleet of 6 vessels, the *Detroit*, *Queen Charlotte*, *Lady Provost*, *Hunter*, *Chippeway*, and *Little Belt*, lying in the offing, and immediately sailed to meet it. On the American side the *Lawrence* and *Niagara*, and on the British the *Detroit* and *Queen Charlotte* were regular vessels of war, the rest were small vessels hastily armed for warfare. The British vessels carried a total of 63 guns and 502 officers and men. The engagement was

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opened by the British, who directed their fire upon the *Lawrence* with such effect that within a short time all her guns were disabled and only 18 out of her force of 101 officers and men remained alive and uninjured. Perry then left the *Lawrence* in a small boat under heavy fire, and took command of the *Niagara*, and bringing his vessels together, passed through the line of British vessels, gave them a raking cross fire, and in 7 minutes compelled the surrender of the 4 principal opponents. The other 2 attempted to escape, but were pursued and captured an hour later. The battle lasted three hours, and the losses on each side were about 130 in killed and wounded, the British commander, Barclay, being among the latter. When Perry saw that victory was assured, he sent the memorable dispatch to Gen. Harrison: 'We have met the enemy and they are ours.'

ERIE, LAKE: most southern of the 5 great lakes drained by the St. Lawrence river; forming part of the boundary between the United States and Canada; bounded n. by the province of Ontario, Canada; s.e. and s. by N. Y., Penn., and O., and w. by Mich.; between lat. $41^{\circ} 25'$ — $42^{\circ} 55'$ n. and long. $78^{\circ} 55'$ — $83^{\circ} 34'$ w.; greatest length 290 m., greatest breadth 57 m., mean 40 m.; circumference 660 m.; greatest depth 312 ft., mean 120 ft.; surface elevation above sea level 565 ft.; area abt. 10,000 sq. m. It is the shallowest lake in the cluster, receives most of its water from Lakes Superior, Michigan, and Huron through the Detroit river, and has a surface 334 ft. higher than that of Lake Ontario, the descent being made in the connecting Niagara river. Beside the Detroit, the principal rivers emptying into it are the Maumee, Sandusky, Raisin, and Cuyahoga. It has several natural harbors that have been rendered valuable by govt. improvements, among which those of Erie, Penn., Dunkirk and Buffalo, N. Y., Cleveland, Sandusky, and Toledo, O., and Ports Maitland, Dover, Burwell, and Stanley, on the Canadian side, are the most important. L. E. occupies a very important position in the channel of trade and steam navigation. Large vessels can pass from it through the Welland canal into Lake Ontario, and thence by the St. Lawrence river and gulf into the Atlantic Ocean, while smaller ones can gain a lower ocean point by entering the Erie canal at Buffalo and the Hudson river at Albany, and making their way thence to New York. Both routes, however, are closed by ice three months during each year. On the other hand, the railroad facilities of its American ports are exceptionally large, and afford an uninterrupted communication with all parts of the United States. Customs districts are maintained by the U. S. govt. at Buffalo and Dunkirk, N. Y., Erie, Penn., and Cuyahoga, Miami, and Sandusky, O. At the w. extremity and near the mouth of the Detroit river, the lake contains a number of very fertile and heavily wooded islands, some under cultivation, and the largest having a circumference of abt. 14 m. Of these Point Pelee, North Harbor, East Sister, Middle Sister, and the Hen and Chicken Islands belong to Canada, and Kelly's, North, Middle, and South Bass, West Sister, Green, Sugar, and Rattlesnake Islands to the

ERIE CANAL—ERIGENA.

United States. It was at Put-in-Bay, South Bass Island, that Com. Perry discovered the British fleet under Capt. Barclay, 1813, Sep. 10, and his memorable battle was fought in its immediate vicinity. See ERIE, BATTLE OF LAKE.

ERIE CANAL: largest canal in the United States; commercially one of the most important and structurally one of the most scientific in the world. It extends from Buffalo to Albany, N. Y., 363 m.; was projected as a means of connecting the great lakes with the Hudson river and the Atlantic seaboard at New York, 1810; constructed under the provisions of a bill adopted in the state legislature, 1817; and completed 1825 at a cost of \$7,602,000. One of the earliest advocates and most constant promoters of the scheme was De Witt Clinton, who memorialized the legislature in its behalf 1815, and as gov. led an imposing naval demonstration down the Hudson from Albany and wedded Lake Erie to the Atlantic Ocean by pouring into the latter some water from the former, 1825, Oct. Originally it was 40 ft. wide at the surface and 4 ft. deep, but subsequent improvements gave it a surface width of 70 ft., bottom width 42 ft. and depth 7 ft. The flow of water is mostly from w. to e., its w. end at Buffalo being 568 ft. above its e. end at Albany. Through its course it has 57 double and 15 single locks. It is twice carried over the Mohawk river on costly stone aqueducts; at West Troy it crosses a ridge 188 ft. high by means of 16 double lift-locks of remarkably skilful construction; and at Albany it is raised 20 ft. by 2 double locks, each 110 by 18 ft. For many years after its completion it was the route of much popular travel, and had a number of comfortable packets running from end to end. It has been the scene of many ingenious and curious experiments to provide a motive power other than animal for canal boats.

ERIGENA, ē-rīj'ē-na or ēr-īj'ē-na, JOANNES SCOTUS: famous philosopher of the middle ages; b. probably in Ireland; lived in the 9th c. Very little is known of his history. He appears to have resided principally in France, at the court of Charles the Bald. In the controversies of his time, regarding predestination and transubstantiation, he took part. His philosophic opinions were those of a Neo-Platonist rather than of a scholastic. His love for the mystic doctrines of the old Alexandrian philosophers was shown by his translation of the writings ascribed to Dionysius the Areopagite, which were a well-spring of mysticism during the middle ages. E. held that God is the essential ground of all things, from whom all things emanate, and into whom they return again. Pantheism, therefore, lurks in his system. His principal work is *De Divisione Naturæ* (published by Gale, Oxford 1681). One of its leading thoughts is the identity of philosophy and religion, when both are properly apprehended. E. uttered his opinions with great boldness, and he showed no less subtlety and strength of intellect in their defense. He expressed his contempt for theological dogmatism, and vindicated the authority of reason over all other authority. His words are: 'Authority is derived from reason, and not reason from authority; and

ERIGERON—ERIOCAULACEÆ.

when the former is not confirmed by the latter, it possesses no value.' Consult Hjort's *Joh. E.* (Copenh. 1823); Staudenmayer, *Joh. E.* (Frankfurt 1834), and Taillandier, *Scot. E. et la Philosophie Scholastique* (Strasb. 1843); Möller, *Scotus E.* (1844); Christlieb, *Leben und Lehre des Scotus E.* (1861); and Huber, *Johannes E.* (1861).

ERIGERON, *ēr-ij'ê-rôn*; genus of plants of the nat. ord. *Compositæ*, suborder *Corymbifera*, having heads (flowers) of many florets, the florets of the ray numerous, in several rows, of a different color from those of the disk. *E. acris* is European, also a native around and n. w. of L. Superior. There are many N. American species; the most common are the tall, white-rayed Horse-weed, the Robin's Plantain, the Daisy Fleabane, and the Common Fleabane (*E. philadelphicum*) with innumerable, narrow, rose-purple rays, and said to be used as a diuretic. The name Fleabane was given on the supposition that certain fetid species would drive away fleas. *Erigeron* was derived from the Greek, meaning Spring old man, referring to the hoary appearance of some vernal species.

ERIN, n. *ēr'in* [L. *Ierne*, Ireland, the L. name being itself a probable corruption of an old Celtic term: comp. Gael. *Iar-innis*, the isle of the west, and *Hibernia*, Ireland]: contr. for Ireland, or its ancient name. **ERINITE**, n. *ēr'î-nit*, a beautiful green arseniate of copper found in Limerick, Ireland.

ERINACEUS and **ERINACEADÆ**: see **HEDGEHOG**.

ERINEUM, n. *ēr'î-nē'ûm* [Gr. *erineos*, of wool; woolen]: in bot., abnormal development of the cells of the epidermis of trees, specially of the *Amentaceæ*, the *Aceraceæ*, and of the *Rosaceæ*. The cells so developed were formerly mistaken for fungi.

ERINGO: see **ERYINGO**.

ERINNA, *ēr-rîn'nâ*: Greek poetess, concerning the date of whose birth the most different statements are advanced. According to some, she was the intimate friend of Sappho (hence E. likewise is called the Lesbian singer), and was born at Rhodes, or on the little island of Telos, w. of Rhodes; while others maintain that she lived in the age of Demosthenes; and others again, perplexed by such a wide difference in point of time, have recourse to the hypothesis of two poetesses of this name. E. acquired such celebrity by her epic, epigrammatic, and lyric poems, that her verses were compared with those of Homer, though she died at the early age of 19. The genuineness of the fragments that exist under her name has been disputed on good grounds. These have been collected by Schneidewin in the *Delectus Poesis Græcæ Elegiacæ* (Göttingen 1838). Compare Malzow *De Erinnæ Lesbie vita et Reliquiis* (Petersburg 1836).

ERINNYS, or **ERINNYES**: see **EUMENIDES**.

ERIOBOTRYA: see **LOQUAT**.

ERIOCAULACEÆ, *ēr-î-ô-kaw-lă'sê-ê*: nat. ord. of endogenous plants, nearly allied to *Restiaceæ*, containing about 200 known species, many of which are aquatic or marsh plants. The E. are natives chiefly of the tropical

ERIOCEPHALUS—ERIOGONUM.

parts of America and Australia. One species, *Eriocaulon septangulare*, JOINTED PIPEWORT, is found in the w. of Ireland, and in some of the Hebrides; a little grass-like plant, growing in lakes which have a muddy bottom, and exhibiting small globular heads of flowers. It is interesting from



Jointed Pipewort (*Eriocaulon septangulare*):

a, tuft of leaves, flower-stalk with flowers, and part of creeping root; b, seed; c, bract or scale; d, female flower; e, pistil; f, male flower.

its botanical affinities, and with reference to geographical distribution. The *E.* form a remarkable feature of the vegetation of some parts of S. America; but many of the species bear little resemblance to their humble northern congener, being almost shrubby, 4-6 ft. high, with leafy, much branched stems, 'each branchlet terminated by a large white ball, composed of a vast number of smaller heads, placed on peduncles of unequal length.' Many grow on arid mountainous regions; others in flat sandy grounds, flooded in the wet season.—Gardner's *Travels in Brazil*.

ERIOCEPHALUS, n. *ēr-ī-o-sēf'-a-lūs* [Gr. *erion*, wool; *kephalē*, the head]: in bot., typical genus of *Eriocéphaleæ*, a sub-tribe of *Asteraceæ*, tribe *Senecionideæ*.

ERIODENDRON, *ēr-ī-ō-dēn'-drūn*: genus of trees of the nat. ord. *Sterculiaceæ*, natives of tropical countries. Their thick woody capsules contain a kind of wool surrounding the seeds; hence the trees are sometimes called **WOOL-TREES**. The wool of *E. Samanna* is used in Brazil for stuffing pillows. *E. anfractuosum*, of which one variety, found in the E. Indies, is sometimes called *E. Indicum*, and another found in Africa, *E. Guineense*, is a tree of great height, 150 ft. or more. The Afri-

can variety or species is called **RIMI** and **BENTANG**. Park mentions it by the latter name. Barth says it is generally seen growing near the principal gate of large towns in Hansa. Its wood is soft and spongy, used chiefly for making canoes. The seeds of *E. Indicum* are eaten in Celebes. They are roundish, and of the size of peas. The trees of this genus have palmate leaves. The flowers are large and beautiful.

ERIOGONUM, n. *ēr-ī-ōg'o-nūm* [Gr. *erion*, wool; *gonu*, the knee, a joint of a plant]: typical genus of *Eriogonææ*, a tribe of *Polygonaceæ*.

ERİOLÆNEÆ—ERIVAN.

ERİOLÆNEÆ, n. *ēr-ī-o-lē'nē-ē* [mod. L. *eriolana*]: a tribe of *Byttneriaceæ*.

ERİOMETER, n. *ēr-ī-ōm'ē-tēr* [Gr. *erion*, wool; *metron*, a measure]: instrument for measuring the diameter of small fibres, such as wool, cotton, or flax, by ascertaining the diameter of any one of the colored rings which they produce.

ERİOMYS, n. *ēr'ī-o-mis* [Gr. *erion*, wool; *mus*, a mouse]: in *zool.*, genus of *Chinchillidæ*. *E. laniger* is the chinchilla.

ERİOPHORUM, n. *ēr-ī-ōf'ēr-ūm* [Gr. *erion*, wool; *phoros*, bearing]: in *bot.*, cotton-grass; genus of *Cyperaceæ* (sedges), tribe *Scirpeæ*. It consists of perennial tufted herbs, with many-flowered spikelets; the glumes imbricated on every side, and several hypogynous bristles, becoming very long and silky. The common *E. angustifolium* is reduced by Sir Joseph Hooker to a variety of *E. polystachyon*. *E. vaginatum* is the Hare-tail, *E. alpinum* the Alpine, *E. polystachyon* includes both the Broad and the Narrow-leaved, and *E. gracile* is the slender Cotton-grass. The silk or cotton from the English species of the genus has been made into paper and the wicks of candles, or used for stuffing pillows. The immature leaves of a Himalayan species, *E. comosum* or *cannabinum*, are used for rope-making.

ERİPHIA, n. *ēr'īf'ī-a* [L. *eriphia*; Gr. *erepheia*, an unknown plant]: in *zool.*, genus of decapod short-tailed crustaceans. *Eriphia spinifrons* is widely diffused in different seas.

ERISMA, n. *ēr-rīz'ma* [Gr. *erisma*, a cause of quarrel; *erizō*, I strive; *eris*, strife: so called from the anomalous character of the structure first described and the genus of *Vochyaceæ*]: in *bot.*, the rachis or axis of grasses.—*E.* is also a genus of S. American *Vochyaceæ*. *E. Japura* is the Japura of Brazil, a fine tree, 80 to 120 ft. high.

ERIVAN, or **ERİWAN**, *ēr-ē-vān'*, or **IRWAN**: govt. of Russia in Transcaucasia; bounded by Georgia, Persia, and Turkish Armenia; watered principally by the Aras or Araxes river. It abounds in gold, silver, other minerals, and salt, and contains the celebrated Mt. Ararat. More than one quarter of the population are tribes of nomadic gypsies of Mohammedan faith, the remainder are pure Armenians. Cap. Erivan.—Pop. of govt. (1889) 677,491.

ERIVAN, or **ERİWAN**, or **IRWAN** (Persian, *Rewān*): fortified cap. of Russian Armenia; n. of Ararat, in the elevated plain of Aras or Araxes, lat. 40° 10' n., long. 44° 32' e., 3,312 ft. above the sea. It consists of the town, properly so called, and the fortress, which is surrounded on three sides by high walls, and provided with aqueducts; a stone bridge over the Zenga, which here falls into the Araxes; barracks, three mosques, one of which has been converted into a Russian church, the palace of the Sardar, and a bazaar. The people are engaged in agriculture and commerce. *E.* was formerly cap. of the Persian province of Aran, celebrated for its silk. In the beginning of the 16th c., the khan Rewan, at the command of Ismael, shah of Persia, erected a strong fortress, which he called after his

ERLANGEN—ERLAU.

own name. An Armenian school was established at E. 1629, but transferred to Ejmiadzin 1631. During the last war between Russia and Persia, E. was stormed by the Russian gen. Paskewitsch, who received the surname of Eriwanski; and by the treaty of peace concluded at Turkmanjai, 1828, Feb. 22, it was given up by Persia to Russia, with the province of the same name. It is now an important Russian post, as in former times it formed the bulwark of Persia against the Turks, and afterward against Russia. In 1840, it was much devastated by an earthquake.—Pop. (1891) 15,040.

ERLANGEN, *ër'lang-én*: town of Bavaria, in a well cultivated district, on the right bank of the Regnitz, 10 m. n. of Nürnberg. It is a handsome town, surrounded by walls pierced by seven gates; its streets—a great number of which were erected after 1706, when a fire consumed a large portion of the town—are straight and regular. It is divided into the Old and New Towns, the latter founded 1686 by Christian, markgraf of Bayreuth. E. is the seat of a univ., of a gymnasium, of agricultural and industrial schools, and other institutions. The univ. is the chief building. It was founded 1742, and is celebrated as a school of Prot. theology, is attended by 400 to 500 students, has a library containing 140,000 vols. and 1,000 manuscripts, and also zoological and mineralogical collections, etc. E. owes its prosperity to the migration thither of a number of refugees from France, who fled on the revocation of the Edict of Nantes, and who introduced many new branches of manufacture. Besides its extensive stocking and glove manufactories, which provide the greater part of Germany with their goods, E. has great mirror and tobacco factories, and manufactures of combs and hornware. E. became a Bavarian possession by the treaty of 1809. Pop. (1880) 14,876; (1885) 15,814; (1890) 17,559.

ERLANITE, n. *ër'lan-ít* [named from *Erla* in the Saxon Erzgebirge, where it is found]: in *min.*, light greenish-gray mineral or rock containing silica, alumina, lime, etc. At first it was considered a mineral, but Dana believes it to be a rock. If the latter view ultimately prevail, the spelling will probably be changed to Erlanite, the termination *-yte* being the modification of *-ite* adopted to distinguish rocks.

ERLAU, *ër'low* (Hung. *Eger*): episcopal city of Hungary, county of Heves, of which it is cap.; on both banks of the river Erlau, in a delightful valley skirted with vine-clad hills. It is surrounded by old walls pierced by six gates; has four suburbs, in which the greater portion of the inhabitants dwell; and though in general its streets are narrow and have a neglected appearance, it is rich in fine public buildings. The principal of these are the Lyceum, with a valuable library, and an observatory 172 ft. high; the recently built cathedral, the episcopal palace, the Franciscan and the Minorite monasteries, a richly embellished Greek church, a county hall, and the new barracks. E. has also a gymnasium, an episcopal seminary, a normal and drawing school, a hospital founded 1730, which has a

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fund of nearly 400,000 guilders, and other important institutions. The two baths, the *Turkenbad* and the *Bischofsbad*, both much resorted to during the bathing-season, are supplied from two warm springs which rise from the bank of the Erlau. The cultivation of the vine is the principal occupation. The E. wine, the best red wine of Hungary, is produced in considerable quantities, and is in request in foreign countries. There are also manufactures of linens, woolens, hats, etc., and an important weekly market. The people mostly are Rom. Cath. in religion, and Magyar in race. E. owes its importance to the very old bishopric founded here by St. Stephen in the beginning of the 11th c., and which, 1804, was raised to an archbishopric. Pop. (1880) 20,669; (1890) 22,427.

ERLKÖNIG, *êrl-kö'nîch* [Elf-king]: German name of a poetical, personified, natural power which, according to German poetical authorities, prepares mischief and ruin for men, and especially for children, through delusive seductions. The name, not connected with the root *erle*, is synonymous with *Elfen König*. The E. was introduced into German poetry from the Sagas of the North, through Herder's translation of the *Erkönig's Daughter* from the Danish, and has become universally known through Goethe's ballad of the *Erkönig*.

ERMELAND, *êr'meh-lânt*: ancient division of Poland, 1,600 sq. m. It is now in the Prussian province of Königsberg, and forms a Rom. Cath. diocese. Pop.(1885) 225,076.

ERMENONVILLE, *êr-mêh-nông-vîl*: village in the s.e. of the dept. of Oise, France, in the possession of the Girardin family. It is celebrated for beautiful and extensive parks, and as the resting-place of Rousseau, for which reason it is much visited in summer by strangers from Paris. It was also the residence of Gabrielle d'Éstrées, the mistress of Henry IV., who inhabited a hunting-tower, part of which, still standing, bears her name. It became still more celebrated after the death of Rousseau 1778. During the revolution, his ashes were removed to the Pantheon, but conveyed back to E. after the restoration. It had nearly been purchased by the *Bande Noire*, but a larger sum was offered by Stanislaus de Girardin, the well-known liberal deputy, and E. was preserved for the lovers of art, of nature, and of historical monuments.

ERMINE, n. *êr'mîn* [OF. *ermine*; F. *hermine*—from mid. L. *armēniūs*, a fur of Armenia], (*Mustela erminea*): the stoat, a species of weasel (q.v.), considerably larger than the common weasel, but much resembling it in general form and other characters, and in habits. The E. is almost ten inches in length, exclusive of the tail, which is fully four inches and a half long. It is of a pale reddish-brown color in summer, the under parts yellowish-white, the tip of the tail black: in winter—in cold countries or severe seasons—the upper parts change to yellowish-white or almost pure white, the tip of the tail, however, *always* remaining black. This change takes place more frequently in northern than in southern localities, but sometimes even

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in the south of England; and when it is only partially accomplished, the animal has a piebald appearance, and often remains so during the milder winters. It is in its winter



Ermine:
Summer and winter dress.

dress that it is called E., and yields a highly valued fur; more valuable, however, when obtained from the coldest northern regions than from temperate countries. In its summer dress it is called Stoat. It displays indomitable perseverance in the pursuit of its prey, which consists very much of rats, water-voles, and other such small quadrupeds; with young hares and rabbits, grouse, partridges, etc. The eggs of birds are as welcome to it as the birds themselves. The E. is a native of all the n. parts of the world. Its range extends even to the s. of Europe. It delights in Moorish districts, and is abundant in the n. of Scotland. It is from Norway, Lapland, Siberia, and the Hudson's Bay territories that the E. skins of commerce are obtained, used not only for ladies' winter garments, but for the robes of kings and nobles, and for their crowns and coronets. E. has thus obtained a distinct recognition in heraldry. Being used for the robes of



Ermine.

judges, it has come to denote the judicial office or dignity, and to be an emblem of purity and honor without stain. In making up E. fur, the tails are inserted in a regular manner, so that their rich black shall contrast with the pure white of the rest of the fur.—*Ermine*, in heraldry, white fur, with black spots; the reverse of which, or a black fur with white spots, also used in heraldry, is called *Contre Ermine*. Ermine is commonly used to difference the arms of any member of a family who is connected with the law. A cross composed of four ermine spots is said to be a Cross Ermine. ERMINED, a.-mind, adorned or clothed with ermine.

ERNE, *ern*: river and lake in the s.w. of Ulster province, Ireland. The river rises in the s. of Cavan county, in the small but beautiful Lough Cowna. It runs n. and n.w.,

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merging in Lough Oughter, in Cavan county, and in Lough Erne in Fermanagh county, and passes Enniskillen and Ballyshannon. It then flows through the s. corner of Donegal county into Donegal Bay; total course 72 m. On the river, at Ballyshannon, is a salmon-leap fall, over a rocky ledge 20 ft. high and 150 yards broad, and the river leaps over another rocky ledge near Belleek, $2\frac{1}{2}$ m. below the lower end of the loch. Lough Erne, one of the finest lochs in the kingdom, is the most attractive feature of Fermanagh county, which it bisects lengthways, and almost entirely drains. It extends 40 m. from s.e. to n.w., and consists of two lakes, the upper and lower, joined by a narrower part 10 m. long, and assuming in parts the character of a river, with Enniskillen midway between the two lakes. The Upper Lough is 12 by 4 m. in extent, 10 to 75 ft. deep, 151 ft. above the sea, and has 90 green hilly islets. The Lower Lough is 20 by $7\frac{1}{2}$ m. in extent, 100 to 266 ft. deep, 148 ft. above the sea, and has 109 islets. On one of the islets is a round tower. The waters contain salmon, trout, pike, bream, and eels. The scenery is singularly varied and beautiful.

ERNE, *ern* (*Haliaeetus*): genus of birds of the family *Falconidae*, and of the eagle group; differing from the true eagles in the greater length of the bill, in the toes and lower part of the tarsi being destitute of feathers, and generally, also, in frequenting the sea-coast and the banks of lakes and rivers to feed on fish, in feeding like vultures on carrion almost as readily as on newly killed prey, and in inferior courage. The northern hemisphere has the COMMON E. (*H. albicilla*), known also as the Sea Eagle or



Common Erne (*Haliaeetus albicilla*).

White-tailed Sea Eagle. It is much more common in Britain than the Golden Eagle, is sometimes seen even in the s. of England and in inland districts, occasionally visiting deer-parks to prey on very young fawns or to

devour dead deer; but is more frequent in the n. of Scotland, doing considerable injury to flocks in Sutherlandshire, particularly during the season of young lambs. Its favorite haunts, where it roosts and makes its nest, are the shelves and ledges of stupendous precipices on the coast, where its scream often mingles with the noise of the perpetual surge. It sometimes also breeds on crags beside inland lakes, as at the Lakes of Killarney, and more rarely even on trees. Fishes are certainly its favorite food, though its mode of procuring them is not well known; but water-fowl also are its very frequent prey. It is found in most parts of Europe, and even in the islands of the Mediterranean, but is more abundant in the n. of Europe and Siberia. It occurs in N. Amer. only in Greenland. In size, the E. is inferior to the Golden Eagle, being seldom more than 33 inches in its whole length. The general color of the plumage is brown, the head having a paler yellowish tinge, the tail in the adult bird is pure white. The young, called sometimes the Cinereous Eagle, has a grayer plumage and mottled tail.—Another notable species of this genus is the WHITE-HEADED E. (*H. leucocephalus*) of America, called also the White-headed Eagle, Bald Eagle, and Sea Eagle, the chosen symbol of the United States. It is a bird of about the same size with the Common E., with dark-brown plumage, and—in an adult state—the head, neck, tail, and belly white. It is found in almost all parts of N. America, visiting the arctic regions in summer, but abounding chiefly in the southern states between the Atlantic and the Mississippi. It frequents both the sea-coast and the lakes and rivers, and may be often seen sailing through the column of spray at the Falls of Niagara. It is very fond of fish, which it procures by wading in shallow streams, and also by compelling the osprey to relinquish prey just taken. The soaring and evolutions of the birds in the air on such occasions are described as sublime. The White-headed E. feeds also on lambs, fawns, poultry, etc.; kills swans, geese, and other water-fowl; and does not disdain to compel vultures to disgorge for its use the carrion which they have swallowed. On account of its habits and dispositions, Franklin expressed his regret that it had been chosen as the symbol of his country. A Bald Eagle, of large size and young coloring, was named by Audubon the Bird of Washington (*H. Washingtonii*).—Australia produces a beautiful species (*H. leucogaster*), and numerous species are found in other parts of the world, among which are some of comparatively small size, as the PONDICHERRY KITE, or BRAHMANY KITE (*H. ponticerianus*) of India, constantly seen fishing like a gull in the rivers of that country, and by the Hindus considered sacred to Vishnu.

ERNESTI, *ēr-nēs'tē*, JOHANN AUGUST. 1707, Aug. 4—1781, Sep. 11; b. Tennstädt, in Thüringia: theologian and philosopher. He studied at Pforta, Wittenberg, and Leipsic; but after having been appointed rector of the Thomas-school in Leipsic, 1734, turned his attention chiefly to the old classic literature, and the studies connected with it.

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In 1742, he became prof. extraordinary of ancient literature in the Univ. of Leipsic, in 1756 prof. of rhetoric, in 1759 prof. of theology. E. paved the way to theological eminence by a thorough study of philology, and was thus led to a more correct exegesis of the biblical authors, and to an interpretation less hampered by theological opinion. Mainly to him is due the present method of theological exposition, so far as it rests upon correct grammatical elucidation. He showed his ability as an accurate critic and grammarian, in his editions of Xenophon's *Memorabilia of Socrates*; the *Clouds* of Aristophanes, *Homer*, *Callimachus*, *Polybius*, *Suetonius*, and *Tacitus*; but above all, by his admirable edition of Cicero (5 vols. Leip. 1737-39), to which he added a *Clavis Ciceronia*, by way of supplement. He was also the first reviver of true and manly eloquence in Germany. His theological writings are numerous. The most remarkable are the *Initia Doctrinæ Solidioris*, the *Institutio Interpretis Novi Testamenti* (translated into English), the *Anti-Muratorius* (1755), and the *Opuscula Theologica* (1792). Compare Bauer, *Formulæ ac disciplinæ Ernestianæ indoles* (1782); Stallbaum, *Die Thomas-schule zu Leipzig* (1839).

ERNST, *ĕrnst*, Elector of Saxony: d. 1486: founder of the Ernestinian line, or the elder branch of the princely House of Saxony. He was the elder son of the Elector Friedrich the Mild, and of Margaret, Archduchess of Austria. When only 14 years of age, he was seized and carried off from the castle of Altenburg, with his brother Albrecht, but was speedily recaptured. This incident, known in German history as the Stealing of the Princes (*Prinzenraub*), was described with extraordinary vividness by Carlyle in the *Westminster Review*, 1855, Jan. He succeeded to the electoral dignity on the death of his father 1464, but governed in common with his brother for 21 years. In 1485, however, E. and Albrecht divided the paternal possessions, when the former obtained as his share Thuringia, the half of the district then called Osterland, with Voigtland, the Franconian estates of the House, the electoral dignity, and the dukedom of Saxony. E. took great interest in the welfare of his people. Against injustice, tyranny, and lawlessness, he was implacable. He died at Kolditz. It is next to impossible to trace the course of the Ernestinian line through the labyrinthine mazes of the endless German genealogies; it is sufficient to say that after 1638 the Ernestinian line was represented by the Dukes of Weimar, who gradually obtained the whole possessions of the House. Johann, Duke of Weimar (d. 1605), left several sons, the eldest of whom, Wilhelm, became founder of four different branches, all, however, reunited under Ernst August, Duke of Weimar (d. 1748). After 1815, the duchy of Weimar became the grand-duchy of Saxe-Weimar-Eisenach, and its present ruler is of course the direct representative of the Ernestinian line. The other three families by which also it is now represented are those of Meiningen, Saxe-Coburg-Gotha, and Saxe-Eisenburg.

ERNST I.—ERNST II.

ERNST I., surnamed the Pious: Duke of Saxe-Gotha and Altenburg, founder of the House of Gotha; 1601, Dec. 24—1675; b. at the castle of Altenburg; son of Johann, Duke of Weimar (d. 1605); thus connected with the main Ernestinian line. E. was the ninth of ten brothers, the youngest of whom was the famous Bernhard (q. v.) von Weimar. He received an excellent education from his mother, Dorothea Maria von Anhalt. After the arrival of Gustavus Adolphus in Germany, E. entered the Swedish service, and in various engagements showed great courage and skill, completing the victory of the Protestants at Lützen, after the fall of Gustavus. After the battle of Nördlingen, 1634, Aug. 26, E. withdrew from the theatre of strife, and for the rest of his life applied himself to restoring the prosperity of his territories, frightfully devastated during the Thirty Years' War. Of his seven sons, the eldest, Friedrich, continued the line of Gotha, while the third became the founder of the House of Meiningen, and the seventh, the founder of the House of Saalfeld. E. is a fine type of the old German Prot. prince. Zealously attached to the doctrines and government of the Lutheran Church, he exercised a constant watch over its religious and educational interests. With the formalism, however, that often characterizes 'strictly religious' people, he compelled his children to learn the whole Bible by heart. He was much interested in the advance of Christianity abroad, and invited to his court the Abbot Gregorius from Abyssinia, besides sending thither on a religious embassy Joh. Mich. Wansleb of Erfurt. He also carried on a correspondence with the king of Ethiopia and the Patriarch of Alexandria. His line became extinct by the death of Friedrich IV. 1825.

ERNST II. (AUGUST KARL JOHANNES LEOPOLD ALEXANDER EDUARD): Duke of Saxe-Coburg-Gotha; b. Coburg, 1818, June 21; elder brother of the late Prince Albert (q. v.). Both brothers received an admirable literary and scientific education. The family to which E. belongs is a branch of the Ernestinian line, having been founded 1680 by Albrecht, second son of Ernst the Pious (q. v.). When E. had completed a university curriculum at Bonn, he entered the military service of the king of Saxony, but left it on his marriage with the daughter of the Grand-duke of Baden. In 1844, E. succeeded his father as Duke of Saxe-Coburg-Gotha. In his opinions and aspirations, imbued with the spirit of his age, he has introduced into his little dominions many beneficial reforms, and allayed not a few long-standing jealousies. Yet one regrets to say, that his enlightened views of his duty as a ruler have not been generally appreciated by his subjects. During the stormy period of 1848-9, by spontaneous concessions on the one hand, and on the other by energetic repression of the political anarchists, he succeeded in saving his territories from the perils of revolution. In the Slesvig-Holstein war, E. took a prominent part, and won the Battle of Eckenförde, 1849, Apr. 5. E. was a great advocate for the unity of the German nation, and prominent in most of the efforts made in that direction. His leisure hours are devoted to music and the fine arts.

ERNST—EROS.

His operas, *Casilda*, *Santa Chiara*, and *Diana von Solanges*, are well known in Germany. In 1861 he published a pamphlet vindicating his government, and in 1864 an account of a tour in Egypt.

ERNST, HEINRICH WILHELM: 1814–1865, Oct. 8; b. Brünn, Moravia: violinist. He studied at the Vienna Conservatorium. At the age of 16, his talents excited much interest in Germany; and he soon afterward performed in Paris. His first visit to London was in 1843; and he returned in subsequent years, spending the intervals in Paris and in different parts of Germany. His playing was characterized by immense brilliancy, combined with passion and sentiment. He suffered much from acute neuralgia, which latterly interfered with the exercise of his art; and the last seven years of his life were spent at Nice, where he died. E.'s compositions have generally a bravura character, and include works for the violin and orchestra, quartets, etc.

ERODE, v. *ē-rōd'* [L. *erōdēre*, to consume or eat away—from *e*, out of; *rōdō*, I gnaw]: to eat in or away; to corrode. ERO'DING, imp. ERO'DED, pp.: ADJ., in *bot.*, irregularly toothed as if gnawed. ERO'SIVE, a. *-z'iv* [L. *erōsus*, consumed]: that eats away. ERO'SION, n. *-zh'ūn* [F.—L.]: act of gradually wearing away; state of being gradually worn away; influence of a stream or river in hollowing out its channel. Even the smallest streams, running over soft strata, as clay or sand, cut out channels, and remove the eroded materials. Hollows thus produced have been observed among stratified rocks. One in the coalfield of the forest of Dean has been carefully described. The trough was found to branch, when traced in the progress of mining, over a considerable area, and to assume all the appearances of a little stream, with small tributaries falling into it. When the hollows thus abraded are of considerable extent, '*valleys of erosion*' are produced. Many of the earlier geologists held that rivers had hollowed out their own valleys. The immense amount of materials brought down by rivers, and deposited at their mouths as deltas, shows without doubt that they have contributed materially to produce inequalities on the earth's surface; but the examination of the geological structure of valleys, plainly testifies that almost every great hydrographical basin has derived its form originally from some other agency, though its outline may have been much altered by the continued action of currents within it. EROSE, a. *ē-rōs*, in *bot.*, irregularly toothed as if gnawed or bitten. EROSE'LY, ad. *-l'z*.

ERODIUM, n. *ē-rō'd'z-ūm* [Gr. *erōdios*, a heron, to the bill of which the beak of the fruit presents some resemblance]: in *bot.*, stork's bill, genus of *Geraniaceæ*. About 50 species are known, all from the e. hemisphere.

EROPHILA, n. *ēr-ōf'ī-la* [Gr. *ēr*, ear, the spring; *phileō*, I love]: in *bot.*, genus of crucifers, family *Drabideæ*. It resembles *Draba*, but has deeply cloven white petals, etc., seeds numerous in each cell of the pod. *Erophila verna*, formerly called *Draba verna*, is the common Whitlow-grass

EROS: see CUPID.

EROSTRATUS—ERR.

EROSTRATUS: see **HEROSTRATUS**.

EROTIC, a. *ĕ-rōt'ik* [Gr. *erōtikōs*, relating to love—from *erōō*, I love passionately; *ērōs*, love]: relating to the passion of love; produced by love; designating love-songs; also **EROT'ICAL**, a. *-i-kāl*. **EROTOMANIA**, n. *ĕ-rōt'ō-mā'nī ā* [Gr. *manīā*, madness]: madness produced by love (see **MANIA**). **EROT'OMA'NIAC**, n. *-nī-āk*, one who is mad from love.

EROTYLIDÆ, n. *ĕr-o-tīl'i-dē* [L. *erotylus*, an unknown precious stone; Gr. *erōtulos*, a darling; a sweetheart, from the beauty of some of the species]: in *entom.*, family of tetrameric beetles, with very gibbous bodies, found in fungi. **EROTYLUS**, n. *ĕ-rōt'i-lūs*, the typical genus of the family *Erotylidæ*.

ERPENIUS, *ĕr-pē'nī-ūs* (Latinized from Thomas van Erpen): 1584, Sep. 7—1624, Nov. 13; b. Gorkum, Holland: early Orientalist. At an early age, he was sent to Leyden, where he directed his attention first to theology, afterward particularly to Oriental languages. After travelling through England, France, Italy, and Germany, he became prof. of Oriental languages at Leyden, 1613. Here he erected an Arabic press in his own house, caused new types to be cut, and not only wrote but printed a great number of important works bearing on his favorite studies. The professorship of Hebrew not being vacant at the time of E.'s translation to the Univ. of Leyden, a second Hebrew chair was founded expressly for him 1619. Soon after this he was appointed Oriental interpreter to the govt., in which capacity he read and wrote replies to all official documents from the East. Such was the elegance and purity of his Arabic, that it is said to have excited the admiration of the emperor of Morocco. Toward the close of his life, tempting offers of honors and distinction came pouring in upon him from all parts of Europe; but he was never prevailed upon to leave his native country, where, in the midst of an eminent career, he died. Although the present standard of Oriental knowledge in Europe is much in advance of that of E.'s day, there is no doubt that the impetus of advance has been due principally to him. With hardly any better material than a few awkwardly printed Arabic alphabets, he contrived to write his famous grammar (*Grammatica Arabica, quinque libris methodice explicata*, Leyden 1613; recent ed. by Michaelis, Gött. 1771), which for 200 years, till the time of Silvestre de Sacy, kept undisputed supremacy; and there are many who think his *Rudimenta* unsurpassed, even to-day, as a work for beginners. Among his other important works the best known is his *Proverbiorum Arabicorum Centuriæ Duæ* (Leyden 1614).

ERPETOLOGY, n. *ĕr'pē-tōl'ō-jī* [Gr. *herpētōn*, a creeping thing, a reptile; *logos*, discourse]: that branch of natural science which treats of the structure, habits, and history of reptiles; also spelled **HERPETOLOGY**.

ERR, v. *ĕr* [F. *errer*, to wander—from L. *errārē*, to wander: Ger. *irren*, to wander, to go astray: Fin. *eri*, separate, apart; *ero*, departure: Lap. *erit*, away, to another place: connected with Skr. root, *ar*, to plow]: to wander or stray

ERRAND—ERRATUM.

from the right way; to deviate from the line or path of duty; to miss the right way; to commit error. **ER'RING**, imp.: **ADJ.** uncertain; wandering from the truth or the right way. **ER'RINGLY**, ad. -*lŭ*. **ERRED**, pp. *éřd*.

ERRAND, n. *ěř'ränd* [**AS.** *arend*, an errand: **Icel.** *eyr-endi*; **Sw.** *ärende*, a message]: a message; something to be told or done by a messenger.

ERRANT, a. *ěř'ränt* [**OF.** *errant*—from **L.** *erran'tem*, wandering—from *erro*, I wander]: wandering; rambling. **ERRANTRY**, n. -*tri*, the employment of a knight who wandered about seeking adventures; a wandering. **KNIGHTS-ERRANT**, knights wandering about in search of adventure.

ERRANTIA, n. *ěř rän'shŭ-a*, or **ERRAN'TES**, n. -*těz* [the first form is the neut., the second the masc. and fem. plu. of **L.** *errans*, pp. of *erro*, I err, I wander: named in allusion to their good locomotive powers]: in *zool.*, errant annelids; the highest order of *Annelida*. They are called also *Chaetopoda*, from the setigerous foot-tubercles which are their chief distinctive characteristics; *Nereides*, from their typical genus, *Nereis*; and, from the place which many of them inhabit, Sandworms. The head is well marked; the mouth has jaws which are sometimes at the extremity of a proboscis. The respiratory organs are in the form of external branchiæ arranged in tufts along the back and sides of the body, whence they are called Dorsibranchiate Annelids. They possess distinct sexes, and undergo a metamorphosis. They are marine, and occur in all seas. The order contains the families *Arenicolidae*, *Aphroditidae*, *Nereidae*, *Eunicidae*, *Peripatidae*, and *Polyophthalmidae*: in *paleon.*, the bodies of the Errant Annelids are as a rule so soft that remains of them are not likely to be found, but what appear to be their horny jaws have been brought from the Silurian, the Devonian, and the Carboniferous formations. What may be their burrows, trails, and foot-impressions or prints have been found in the Silurian and some other Paleozoic rocks.

ERRATIC, a. *ěř-rät'ik* [**L.** *erraticus*, wandering to and fro—from *erro*, I wander: **F.** *erratique*]: having no fixed course; irregular; strange; queer; in *med.*, showing or having a tendency to spread; also **ERRAT'ICAL**, a. -*ŭ-käl*. **ERRAT'ICALLY**, ad. -*lŭ*. **ERRATICS**, n. plu. *ěř-rät'iks*, or **ERRATIC BLOCKS**, in *geol.*, those large water-worn blocks of stone, commonly called bowlders, scattered plentifully over the higher and middle latitudes of the n. hemisphere; so called because generally they have been derived from rocks at a distance: see **BOWLERS**: **BOWLER-CLAY**.

ERRATUM, n. *er-rä'tŭm*, **ERRA'TA**, n. plu. [**L.**]: error or mistake in writing or printing: the list of errors with their corrections sometimes placed at the end of a book. From greater carefulness in correcting the sheets of a work in passing through the press, errors in sense or typography are now much more rare than formerly; in many instances, indeed, books (not of great size) are now produced without a single error which needs to be pointed out and corrected. As an

ERRHINE—ERROR.

example of an erratum, for ' terrors ' read ' errors ' in the first sentence of this article. On this subject interesting particulars are given in Disraeli's *Curiosities of Literature*, of which the following is a specimen: ' Besides the ordinary *errata* which happen in printing a work, others have been purposely committed, that the *errata* may contain what is not permitted to appear in the body of the work. Wherever the Inquisition had any power, particularly at Rome, it was not allowed to employ the word *fatum*, or *fata*, in any book. An author, desirous of using the latter word, adroitly invented this scheme: he had printed in his book *facta*, and in the *errata* he put, " For *facta*, read *fata*.' "

ERRHINE, a. *ēr'rīn* [Gr. *errhīnōn*, a medicine for inciting sneezing—from *en*, in, and *rhīn*, the nose]: in *med.*, affecting the nose; producing discharge from the nose: *N.* medicines administered locally to produce sneezing and discharge from the nostrils in catarrh, and in various disorders of the head and eyes. Common snuff, and various other vegetable irritants in powder are used.

ERRONEOUS, a. *ēr-rō'nē-ūs* [mid. L. *errōnēūs*, wandering about—from *erro*, I wander]: not conformable to truth; wrong; false; mistaken. **ERRO'NEOUSLY**, ad. -*lī*. **ERRO'NEOUSNESS**, n. the state of being erroneous or false. **ERROR**, n. *ēr'er* [F. *erreur*—from L. *errōrem*, a wandering, an error]: a deviation from truth; a sin or transgression; involuntary wandering from the truth; a blunder; a mistake; in *law*, a writ so called, which carries the suit for redress to another court (see **ERROR**, **PROCEEDINGS IN**). **ER'RO'RIST**, n. -*ēr-ist*, one who encourages and propagates error.

ERROR, PROCEEDINGS IN: form by which the unsuccessful party in an action at law brings his case for consideration before a court of review. (See **EXCHEQUER, COURT OF**; **BILL OF EXCEPTIONS**.) Error in law, signifies a mistake of judgment, either as to law or fact. Relief may be had against errors of fact in civil and criminal cases, but not against errors of law, since everyone is presumed to know the law. A mistake made in the trial or decision of a case, prejudicial to the party raising the question also is denominated error, and may constitute a ground for reversing the judgment. Error is also synonymous with writ of error. **WRIT OF ERROR**, common law method of reviewing legal proceedings and decisions. It consisted originally in England of a commission issuing out of the court of chancery to judges, authorizing them to examine the record upon which a judgment claimed to be erroneous, had been rendered, and on the examination thereof, to affirm or reverse such judgment, as the law might require. The writ was grantable as a matter of right in all cases, except treason and felony. If the errors complained of were in matters of fact, the writ was styled *coram nobis* where the case was in the court of queen's bench, the sovereign being presumed to preside in that tribunal; if in the other courts the writ was *coram vobis*. Writ of error is abolished in England, Appeal being substituted in its stead. In the United States the writ was

ERRORS—ERSCH.

usually issued out of the appellate court in which the review was sought. Some of the states have abolished writs of error, substituting direct appeals, in civil and criminal cases, while in some jurisdictions both writ of error and appeals are retained. See **APPEAL**, in **LAW**.

ERRORS: mistakes, liable to occur in all observations. The best instruments have imperfections; and no man, however equable his temperament, can always rely on his making a proper use of his senses. In astronomy numerical correctness in the results of instrumental measurements is of the first consequence; therefore it is the constant care of the observer to detect and make allowance for errors. The three principal sources from which they may arise are—1st, External or incidental causes, such as fluctuations of weather, which disturb the amount of refraction; changes of temperature, affecting the form and position of instruments, etc.; 2d, *Errors of observation*, being such as arise from inexpertness, defective vision, slowness in seizing the exact instant of an occurrence, atmospheric indistinctness, etc.; and such errors as arise from slips in clamping and momentary derangements of the instrument; 3d, Instrumental defects, owing to errors in workmanship, and such as arise from the instrument not being properly placed—called errors of adjustment. The first two classes of errors, so far as they cannot be reduced to known laws, vitiate the results of observations to their full extent; but being accidental, they necessarily sometimes diminish and sometimes increase in number and effect. Hence, by taking numerous observations under varied circumstances, and by taking the *mean or average* of the results obtained, these errors may be made to destroy one another to a great extent, and so far may be subdued. The method of subduing errors of the first two classes by the law of average is not applicable in all cases. In certain cases, recourse must be had to what is known as the method of least squares. See **SQUARES**, **METHOD OF LEAST**; also **PROBABILITY**. With regard to the third class, it is the peculiarity of astronomical observations to be the ultimate means of detection of all defects of workmanship and adjustment in instruments, which by their minuteness elude every other mode of detection. See Sir John Herschel's *Outlines of Astronomy*, § 138 *et seq*.

ERS, n. *érs* [L. *erum*]: in bot., *Erum Ervilia*, the Bitter Vetch.

ERSBYITE, n. *érz'bý-ít* [Sw. *ersbyit*]: in *min.*, a doubtful mineral, called also anhydrous scolecite. It is monoclinic, of a white color and vitreous lustre, and a hardness of six. Dana thinks that it may be altered orthoclase.

ERSCH, JOHANN SAMUEL: 1766, June 23—1828, Jan. 16; b. Grossglogau, in Lower Silesia: founder of German bibliography. He had from an early period a bias toward that branch of literature in which he obtained so high a reputation. At Halle, where he was sent to study theology, 1785, he applied himself to historical investigations. After several vicissitudes, he obtained, 1800, the office of librarian to the Univ. of Jena. Three years later, he was called to Halle

ERSE—ERSKINE.

as prof. of geography and statistics; and in 1808, was appointed in addition, principal librarian. He died at Halle. E. was long engaged in miscellaneous bibliographical work for other scholars; but in 1818, with Gruber, commenced the publication at Leipsic of the *Allgemeine Encyclopädie der Wissenschaften und Künste* (Universal Encyclopædia of the Science and Arts), a work of immense value. By his *Handbuch der Deutschen Literatur seit der Mitte des 18 Jahrh. bis auf die Neueste Zeit* (Handbook of German Literature from the Middle of the 18th C. to the most Recent Time, 4 vols. 1812-14), he first established modern German bibliography in the technical sense.

ERSE, n. *ers* [contr. from *Irish*] name given by the Lowland people of Scotland to the branch of the Celtic language spoken by the inhabitants of the Western Highlands, as being of Irish origin: see BRETTS AND SCOTS. The proper name is Gaelic (q.v.).

ERSEK'-UJVAR': see NEUHAUSEL.

ERSKINE, *ers'kīn*, EBENEZER: founder of the Secession Church in Scotland: 1680, June 22—1756, June 22; son of the Rev. Henry Erskine, minister of Chirnside, in Berwickshire, descendant of the noble family of Mar. He studied at Edinburgh, and after acting for some time as tutor and chaplain in the family of the Earl of Rothes, he was licensed to preach by the presbytery of Kirkcaldy 1702. In the following year he was appointed minister of Portmoak, in the shire of Kinross. Here he applied himself indefatigably to the study of the Scriptures, and to a serious and earnest preaching which became exceedingly attractive to the people accustomed to the chilling 'legalism' which then predominated in the Scottish pulpit. On 'sacramental occasions,' he had frequently attendants from the distance of 60 or 70 miles. In 1731, he was transferred to Stirling; his religious peculiarities had brought him into unpleasant relations with some of his brethren, through the interest which he exhibited in a book called the *Marrow of Modern Divinity*, marked by its strong evangelicalism of doctrine and sentiment. After his transference to Stirling, E. distinguished himself by his advocacy of popular rights in the settlement of ministers; and ultimately involved himself in such antagonism to the Church of Scotland, or at least to the ruling party in it of the time, that, with other three clergymen, he was deposed 1733: see UNITED PRESBYTERIAN CHURCH. He was shortly afterward joined by his brother Ralph and several other ministers. They now virtually formed a distinct sect, but continued to occupy their parish churches. An effort was made, 1734, to restore them to their legal connection with the church; it was unsuccessful. In 1736, E. and his friends formally seceded, but it was not till 1740 that they were ejected from their churches. Shortly after this, a furious, and, as it now seems, a contemptible squabble broke out among the seceders in regard to the propriety of taking the burgess-oath. The result was a division of the sect into two bodies, the Burghers and Antiburghers. E. was the leader of the Burghers.

ERSKINE.

ERS'KINE, JOHN, of Carnock, afterward of Cardross: eminent Scottish jurist, and prof. of Scots law in the Univ. of Edinburgh: 1695—1768; son of the Hon. John E. of Carnock, third son of Lord Cardross, whose descendants have now succeeded to the earldom of Buchan. John E., the father, having been forced to quit Scotland, from his attachment to the Presbyterian religion, retired to Holland, and became an officer in the service of the Prince of Orange. At the Revolution, he accompanied William to England, and, as a reward for the services, was appointed lieut. gov. of Stirling Castle, and lieut. col. of a regt. of foot. John E., the younger, became a member of the Faculty of Advocates 1719, but did not succeed as a practitioner of the law. On the death of Alexander Bain, 1737, E. succeeded him in the chair of Scots Law, and filled that office 28 years. In 1754 he published his well-known *Principles of the Law of Scotland*, the text-book thenceforth used in legal study. On his retirement from the professorship in 1765, he prepared his more important work, *The Institutes of the Law of Scotland*, not published till five years after his death. Mr. E. was twice married: one of his sons was the Rev. Dr. John E. As a legal writer, Mr. E. is inferior to none of the Scottish jurists, with the exception of Lord Stair, who dealt more with the principles of commercial law as known to our time. But of all those departments—such as feudal conveyancing—which constitute the law of Scotland, as developed by the usages and forms of society in the country itself, there is at the present day no clearer or more trustworthy expositor than Erskine.

ERS'KINE, JOHN, D.D.: 1721, June 2—1803, Jan. 19; son of John E. of Carnock (author of *Institutes of the Law of Scotland*). He studied at the Univ. of Edinburgh, and was licensed to preach by the presbytery of Dunblane, 1743. In the following year, he was ordained minister of Kirkintilloch, where he remained until 1753, when he was presented to the parish of Culross, in the presbytery of Dunfermline. In 1758, he was transferred to New Greyfriars Church, Edinburgh; and in 1767, he was promoted to the collegiate charge of Old Greyfriars, where he had for his colleague Dr. Robertson. In the General Assembly of the Church of Scotland, he was for many years the honored leader of the popular or evangelical party. Between him and Principal Robertson, leader of the moderate party, there was an honorable friendship. E.'s writings are exceedingly numerous. They consist of essays, letters, sermons, dissertations, and pamphlets, etc., mainly religious. Sir Walter Scott, in his *Guy Mannering*, gives a graphic and accurate description of his powers as a preacher.

ERS'KINE, RALPH: 1685, Mar. 18—1752, Nov. 6; b. Monilaws, Northumberland; brother of Ebenezer E. He was ordained to the parish church of Dunfermline 1711. Sympathizing with the sentiments of his brother Ebenezer, he withdrew from the judicatures of the Established Church 1737. In the controversy concerning the burghs-oath he took part with his brother. His fame rests chiefly

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on his *Gospel Sonnets* and other religious works, formerly very popular.

ERSKINE, THOMAS, Lord ERSKINE: 1750, Jan. 10—1823, Nov. 17; b. Edinburgh; youngest son of Henry David, tenth earl of Buchan, who though then reduced to an income of £200 a year, was of a race prolific in men of ability, and ennobled before the era of genuine history. After E. had attended for some time the High School of Edinburgh, the family removed to St. Andrews, at the grammar school of which place, and subsequently at the university, though probably not as a matriculated student, Thomas E. received such education as his parents could afford. They were educating his second brother, Henry, for the Scottish bar: (Henry, afterward the famous Harry Erskine, twice lord advocate of Scotland and a noted wit; 1746, Nov. 1—1817, Oct. 8: for the family history, see Col. Fergusson's *Henry Erskine: His Kinsfolk and Times*, 1882). The parents sent E. to sea as a midshipman. In this capacity he served for four years, until the death of his father, when he purchased a commission in the First Royals, and was for some time stationed at Minorca, where he employed his leisure in the study of English literature. On his return to London, his birth, his acquirements, the elegance of his manners, and volubility of his conversation, procured him a warm reception in the best circles. It was then that he had the controversy with Dr. Johnson on the respective merits of Fielding and Richardson, which Boswell has recorded; and that he published a pamphlet on the prevailing abuses in the army, which, though anonymous, was well known to be his, and obtained a great circulation. E. grew tired of the army as a profession, in which he saw little chance of promotion; and while in this humor, an accidental interview with Lord Mansfield at an assize court, determined him to study law. He was admitted a student of Lincoln's Inn, 1775, Apr. 26; and 1776, Jan. 13, he entered his name on the books of Trinity College, Cambridge, as a gentleman commoner. Many anecdotes are told of the privations which E. underwent when studying for the bar—how he lived on 'cow-heel and tripe,' dressed so shabbily as to be quite remarkable, and boasted that *out of his own family* he did not know a lord. Lord Campbell says, that 'during Easter and Trinity terms he excited a great sensation in the dining-hall by appearing in a student's black gown over the scarlet regimentals of the Royals; *probably not having a decent suit of plain clothes to put on.*' Though E. was aided by his aristocratic connection, his rise was very wonderful. Without the advantage of a business training, or what, probably even in those days, was far more important, a business connection, he rose into practice with almost unprecedented rapidity. After his first speech, the attorneys actually flocked round him with their retainers, and in telling the story, he used sometimes to bring the number which he received before quitting Westminster Hall up to sixty-five! His two first clients were officers in the navy—Captain Baillie, who held an office in Greenwich Hospital, against whom a rule had been obtained calling upon him to show

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cause why a criminal information for a libel reflecting on Lord Sandwich's conduct as gov. of the charity, should not be filed upon him; and Admiral Keppel, who was tried by a court-martial at Portsmouth for incapacity and misconduct in an encounter with the French fleet off Ushant; and in both cases E. derived benefit from his own early connection with the service. Admiral Keppel sent him two £500 notes as a fee. From this time, E.'s good fortune as an advocate was uninterrupted. In 1783, he was returned to parliament for Portsmouth. Four years and a half after he was called to the bar, he had cleared £8,000 to £9,000, besides paying his debts, he had his silk gown, business of at least £3,000 a year, and a seat in parliament, and had made his brother lord advocate. In parliament, on the other hand, he failed so egregiously in his first speech as to leave his admirers scarcely any hope, and what is remarkable, his failure and Lord Eldon's took place the same night. To some extent the phenomenon was accounted for by Sheridan's remark when he said to him: 'Erskine, you are afraid of Pitt, and that is the flabby part of your character.' But notwithstanding his political mortifications, his professional career went on with increasing brilliancy. In 1786, he was made attorney-general to the Prince of Wales, by whom he was warmly patronized, but toward him and every one else he exhibited that manly independence which was the best part of his character. The fact of his appearing as counsel for Thomas Paine may be counted to his credit, while his removal in consequence from his office was declared by Lord Campbell a lasting disgrace to those from whom the measure proceeded. Throughout the political trials at that troubled period, he enacted the same manly part. When E. was proposed for the woolsack, an office far beyond his legal attainments, the king, George III., in consenting exclaimed: 'What! what! well! well!—but remember he is your chancellor, not mine.' Yet his decisions as lord-chancellor, according to Lord Campbell, are not so much *bad* as *superficial*, though by some equity practitioners they are spoken of as the *Apocrypha*. E. was engaged in the defense of Queen Caroline.

ERSMERT, n. *ěrs'mért*: the plant *Polygonum Hydro-piper*; called also smart-weed.

ERST, ad. *ěrst*: see under ERE. ERST-WHILE, till then; till now; formerly.

ERSWORT, n. *ěrs'wěrt*: the herb mouse-ear (*Hieracium Pilosella*).

ERUBESCENT, a. *ěr'û-běs'ěnt* [L. *erubescēn'tem*, growing red—from *e*, out of; *rûbĕr*, red]: reddish; flushing. ER'UBES'CENCE, n. *-ěns*, redness of the skin or surface of anything. ER'UBES'CITE, n. *-běs'it*, purple copper ore—a sulphide of copper and iron.

ERUCA, n. *ě-rŭ'ka* [L. a caterpillar]: insect in the larval state; a caterpillar.—E. is also a genus of plants of the ord. *Crucifera*, family *Brassicidæ*. The seeds have a burning taste, and applied to the skin cause blisters. *Eruca sativa*,

ERUCARIDÆ—ERVUM.

formerly called *Brassica eruca*, is used in the south of Europe, its native region, as a salad, the young and tender roots alone being chosen. The whole plant has been used as a sialologue.

ERUCARIDÆ, n. *ēr-ō-kār'ī-dē* [mod. L. *erucaria*]: a family of crucifers, tribe *Spirolobee*, of which *Erucaria* is the type.

ERUCIC ACID, *ēr-ū'sīk-* [L. *erūcā*, a species of colewort]: an organic body of the oleic acid series, obtained from-oil of mustard and rape-seed.

ERUCTATE, v. *ēr-rūktāt* [L. *eructātūs*, belched out—from *e*, out of; *ructātus*, belched: It. *eruttare*: F. *éructer*]: to throw up foul air from the stomach; to belch. **ERUCTATING**, imp. **ERUCTATED**, pp. **ERUCTION**, n. *ērūktā'shūn* [F.—L.]: the act of belching wind or foul air from the stomach; the wind itself; a belch; a violent bursting forth of gaseous and liquid matter from any orifice or opening, as from the crater of a volcano or geyser.

ERUDITE, a. *ēr'ū-dīt* [L. *erūdītus*, free from rudeness, cultivated—from *e*, out of; *rūdis*, rough: It. *erudito*: F. *érudit*—*lit.*, free from rudeness and ignorance]: instructed; conversant with books; learned. **ERUDITION**, n. *-dīsh'ūn* [F.—L.]: knowledge gained by study of books; learning in literature; scholarship. **ERUDITELY**, ad. *-dīt-lī*.—**SYN.** of 'erudition': learning; knowledge; science; literature; letters.

ERUGINOUS, a. *ēr-rūj'ī-nūs* [see **ÆRUGINOUS**]: resembling the rust of copper or brass.

ERUMPENT, a. *ēr-rūm'pēnt* [L. *e*, out of; *rumpēn'tem*, breaking]: in *bot.*, prominent, as if bursting through the epidermis, as in some tetraspores.

ERUPTED, a. *ēr-rūptēd* [L. *ērūptus*, broken out or burst forth—from *e*, out of; *rūptus*, rent asunder]: forcibly thrown out, as from a volcano. **ERUPTION**, n. *-shūn* [F.—L.]: a bursting out from confinement; a violent throwing out of anything, as flames or lava from a volcano; a sudden and overwhelming hostile rush of armed men from one country to another; a breaking out of pustules or pocks on the skin, as in measles, small-pox, etc. **ERUPTIVE**, a. *-tīv*, bursting forth; attended with eruptions or producing them; in *geol.*, applied to igneous rocks, which have evidently burst through the sedimentary strata.

ERVALENTA, n. *ēr-ra-lēn'ta* [L. *Ervum lens*, botanical name of the lentil]: farina or meal of the common lentil, prepared in a special manner. Its use as a food is said to promote the peristaltic action of the bowels.

ERVILIA, n. *ēr-rīl'ī-a* [L. *ervilia*, the bitter vetch]: in *zool.*, lentil-shell; a genus of bivalve mollusks, family *Tellinidae*. Two recent species are known. Distribution: W. Indies, Britain, Canaries, Mediterranean, and the Red Sea.

ERVUM, n. *ēr-rūm* [L., the bitter vetch, *Ervum Ervilia*]: in *bot.*, genus of papilionaceous plants, tribe *Vicieæ* *Ervum lens* is the lentil. *Ervum Ervilia* is the bitter vetch. Its

ERYCIBÆ—ERYINGO.

seeds mixed with flour and made into bread produce weakness of the limbs, and render horses paralytic.

ERYCIBÆ, n. *ēr-ī-sīb'ē-ē* [mod. L. *erycibe*]: in bot., order of plants established by Endlicher for the reception of the genus *Erycibe*, by some others doubtfully ranked at the end of *Convolvulaceæ*. It is from tropical Asia.

ERYCINA, n. *ēr-ī-sī'na* [*Erycina*, name of Venus—from Mount Eryx, now San Giuliano, mountain in Sicily, where she had a temple]: in entom., genus of butterflies, typical of the family *Erycinidæ*. ERYCINIDÆ, n. *ēr-ī sin'ī-dē*, dryads; family of butterflies. The males have only four perfect legs, the females have six. In other respects they resemble the *Lycenidæ* (Argus Butterflies).

ERYINGO, n. *ēr-īng'-gō* [L. *eryngion*, a species of thistle], (*Eryngium*): genus of plants of the nat. ord. *Umbellifera*, having simple umbels, which resemble the heads of composite flowers, a leafy involucre and leafy calyx, and obovate, scaly fruit destitute of both ridges and vittæ. The species are numerous, mostly natives of the warmer temperate parts of the world, with alternate, simple, or divided leaves, which have marginal spines. The SEA ERYINGO (sometimes ERYNGO), or SEA HOLLY (*E. maritimum*), is frequent on sandy sea-shores of Britain; a very stiff, rigid, and glaucous plant. *E. campestre* also has been found in England and Ireland, but is very rare. Its root was formerly much used in some parts of Europe as a tonic. That of *E. maritimum* is used in the same way, and possesses the same properties, being sweet and aromatic. It is sold in a candied state, and was formerly reputed stimulant, restor-



Sea Holly (*Eryngium maritimum*):

a. a floret; b. a petal; c. a stamen; d. the pistil.

ative, and aphrodisiac. Shakespeare makes Falstaff allude to the snowy color and supposed properties of this now

ERYSIMUM—ERYSIPELAS.

almost disused sweetmeat, for the preparation of which Colchester, England, has long been famous. *E.* root has been used also as an aperient and diuretic. Linnaeus recommends the blanched shoots of *E. maritimum* as a substitute for asparagus. *E. fetidum*, native of the warm parts of America, is called Fit-weed in the W. Indies, a decoction of it being much used as a remedy in hysterical cases. *E. aquaticum*, native of low wet places in N. and S. America, is called Rattlesnake Weed and Button Snakeroot. The root is diaphoretic and expectorant, and has a spurious reputation as a cure for the bite of the rattlesnake.

ERYSIMUM, *ê-ris'i-mum*: genus of plants of the nat. ord. *Cruciferae*, tribe *Sisymbrieae*. The pod is four-sided. *E. cheiranthoides*, a branching annual, about 18 inches high, with lanceolate scarcely toothed leaves and small yellow flowers, is found in many parts of Europe, also in N. America. It is common in waste places and cultivated grounds in Britain, but may perhaps have been originally intro-



Erysimum Cheiranthoides:

a, root; *b*, a branch, in which flowering has recently begun; *c*, the summit of a branch in a more advanced state, showing the fruit; *d*, the calyx; *e*, the parts of fructification, divested of floral envelopes; *f*, a flower.

duced for its medicinal use. Its seeds were formerly much used as an anthelmintic, from which it has the name of WORM-SEED. It is called also TREACLE MUSTARD, because it was an ingredient in the famous *Venice Treacle*. *E. peroliatum* is cultivated in Japan for the fixed oil of its seeds. Some of the plants formerly referred to *E.* are now included in other genera, as *Sisymbrium* and *Alliaria* (q.v.).

ERYSIPELAS, *n. êr'i-sîp'ê-lâs* [L. *erysipêlas*—from Gr. *erûsipêlas*, a red eruption on the skin—from *erûthrôs*, red; *pella*, skin]: an eruption of a fiery inflammatory nature on

ERYSIPHE—ERYTHEMA.

some part of the body; the disease called St. Anthony's fire; the rose. ERYSIPELATOUS, a. *ēr'ī-si-pēl'ă-tūs*, eruptive; of or resembling erysipelas.—*Erysipelas* is an inflammatory and febrile disease of the skin, attended by diffused redness and swelling of the part affected, and in the end either by desquamation or by vesication of the cuticle or scarf-skin, in the milder forms, and by suppuration of the deeper parts in the severer varieties (phlegmonous erysipelas). Erysipelas affects, in a large proportion of instances, the face and head; it is apt to be attended with severe and typhoid fever (see FEVER), and often with great disorder of the nervous system, arising in some instances from inflammation of the membranes of the brain. In other parts of the body, severe or phlegmonous erysipelas is apt to be succeeded by protracted and exhausting suppurations, and sometimes by diseases of the bones, or inflammations of the internal organs. Erysipelas is frequently an epidemic (q.v.) disease; it is also very apt to recur in a person who has been attacked once or oftener; and this is especially true of the form which affects the face. It is seldom that depletion is allowable in erysipelas, but the bowels should be well cleared out in most cases, and a diuretic (q.v.) given, after which the treatment consists for the most part in watching narrowly the progress of the case, keeping up the strength as well as possible, and obviating special dangers as they occur. In some cases, iron is used as a specific remedy.

ERYSIPHE, n. *ēr'is'ī-fē* [Gr. *erūsibē*, mildew]: in *bot.*, old genus of fungi now much reduced in extent by the removal from it of various species now ranked under distinct genera. When undeveloped they are called Oidia.

ERYTHACUS, n. *ēr'īth'a-kūs* [Gr. *eruthainō*, I dye red, I cause to blush, in allusion to the red plumage of the Robin Redbreast, a species of the genus]: typical genus of *Erythacinae*, sub-family of warblers, of the e. hemisphere. The American robin, a thrush, was misnamed by colonists.

ERYTHEMA, n. *ēr'ī-thē'mă* [Gr. *erūthēmă*, redness—from *erūthainō*, I make red]: in *med.*, a superficial redness of the skin; minor form of erysipelas (q.v.), presenting the same tendency to diffusion and redness, but not so much swelling, and little disposition toward suppuration, or even vesication. It is dangerous chiefly when it presents itself in a wandering shape, attended with slow consuming fever. The muriated tincture of iron, in doses of 20 drops in water every hour or two, has been regarded as a specific in this disease, as well as in erysipelas. Some forms of erythema are distinctly connected with constitutional diseases, as gout, rheumatism, syphilis, etc., and depend for their cure on the removal of the cause. ERYTHEMATOUS, a. *-thēm'ă-tūs*, pertaining to. ERYTHEMAT'IC, a. *-măt'ik*, a term applied to skin affections marked by or associated with redness, specially relating to erythema, erysipelas, and the more common rose-rash and nettle-rash. ER'YTHRINE, n. *-thrīn* [Ger. *erūthros*, red]: a mineral of a carmine and peach-blossom red color; arseniate of cobalt, or

ERYTHRÆA—ERYTHRORCHIS.

cobalt-bloom, used for the manufacture of small. **ERYTHRIN**, n. *ēr'ī-thrīn*, a very complex aromatic body found in certain lichens; also called **ERYTHRIC ACID**. **ER'YTHRITE**, n. *-thrīt*, a mineral, a flesh-colored variety of felspar; & tetravalent alcohol obtained as a solid white substance from certain lichens and fungi.

ERYTHRÆA: see **CENTAURY**.

ERYTHRÆAN SEA: in *anc. geog.* the Persian and Arabian gulfs, and a further undefined portion of the Indian Ocean. Later, the name denoted the Arabian Gulf.

ERYTHRINA: see **CORAL FLOWER**.

ERYTHROLITMIN, n. *ēr-rīth-ro-līt'mīn*: in *chem.*, $C_{26}H_{23}O_{13}$: red coloring matter extracted by Kane from litmus.

ERYTHRONIUM, *ēr-ī-thrō'nī-ūm*: genus of bulbous rooted plants of the nat. ord. *Liliaceæ*, with drooping flowers and the segments of the perianth reflexed. *E. dens canis*, the **DOG-TOOTH VIOLET**, belongs to cent. Europe and s. Siberia; cultivated. The **YELLOW ADDER'S TONGUE** (*E. Americanum*) of the U. S. is a familiar yellow flower in May, with mottled lily-like leaves; bulbs emetic. The **WHITE DOG-TOOTH VIOLET**, leaves little or not spotted, has a yellow variety near Lake Superior.

ERYTHROPHLÆUM, *ēr-rīth-rō-flē'ūm*: genus of trees of the nat. ord. *Leguminosæ*, sub-order *Mimoseæ*. *E. guineense*, native of Guinea, is a very large tree, 100 ft. high, remarkable for the great quantity of red juice which every part of it contains, and interesting on account of the employment of this juice by the natives for an ordeal to test the innocence or guilt of a person accused of crime. The juice is swallowed in large draughts, and those who remain uninjured by it are supposed to be innocent.

ERYTHROPHLEINE, n. *ēr-rīth-ro-flē'in* [mod. L. *erythrophlæum*]: in *chem.*, poisonous base, extracted by alcohol from the bark of *Erythrophlæum guineense*, a tall leguminous tree, on the w. coast of Africa. It is only slightly soluble in ether, benzine, or chloroform, but is soluble in water and in alcohol. It forms salts with acids. In contact with manganese peroxide and sulphuric acid, erythrophleine develops a violet color less intense than that produced by strychnine; the color soon changes to a dirty brown. It acts as a poison by paralyzing the action of the heart.

ERYTHROPHYLL, n. *ēr-rīth-rō-fīl* [Gr. *erūthros*, red; *phullon*, a leaf]: the red coloring matter of leaves, indicating change and low vitality in them.

ERYTHROPROTIDE, n. *ēr-rīth-ro-prō'tīd* [Gr. *eruthros*, red; *prōtos*, first]: in *chem.*, red extractive matter obtained by Mulder from albumen and allied substances.

ERYTHRORCHIS, n. *ēr-rīth'ror-kīs* [pref. *erythro*; Eng. *orchis*]: in *bot.*, genus of orchids, tribe *Arethuseæ*, family *Vanillidæ*. *Erythrorchis scandens* has slender stems a hundred ft. long, and runs like a creeper over trees in wet jungles in the Eastern peninsula and the adjacent islands.

ERYTHROSIS—ERZERUM.

ERYTHROSIS, n. *ě-rĭ-thrō'sis* [Gr. *eruthros*, red]: see **PLETHORA**.

ERYTHROSPERMEÆ, n. *ě-rĭth-ro-spér'mě-ě* [mod. L. *erythrospermum*]: in *bot.*, tribe of *Flacourtiaceæ*. The styles are several, the fruit ultimately splits. **ERYTHROSPERMUM**, n. *-mŭm* [Gr. *eruthros*, red; *sperma*, seed]: typical genus of the tribe *Erythrospermeæ*.

ERTYIROXYLACEÆ, *ě-rĭth-rōks-ŭl ā'sě-ě*: nat. ord. of exogenous plants, allied to *Malpighiaceæ*. They are trees or shrubs, with alternate simple leaves, stipules, flowers growing from amid scale-like bracts, calyx of five sepals, corolla of five petals, each petal having a curious appendage—a plaited scale—at the base, ten stamens united at the base, a 3-celled ovary with two cells empty, and the third containing a single ovule, three styles, and the fruit a drupe. Nearly 100 species are known, natives of warm countries, chiefly of tropical America. To this order belongs the *Coca* (q.v.). The wood of some of the species is bright red; that of *Erythroxylon* (Gr. red wood) *suberosum* is used in Brazil for dyeing, and a permanent red is obtained from it. That of *E. hypericifolium* is the *Bois d'huile* (Oil-wood) of Mauritius.

ERYTHROZYME, n. *ě-rĭth'ro-zĭm* [Gr. *erŭthros*, red; *zumē*, leaven]: in *chem.*, azotized substance, which exists in madder, and gives rise to a peculiar transformation of rubian. It is extracted by macerating madder in water at 38°, and precipitating the aqueous extract with alcohol.

ERYX, or **ERIX**, n. *ě-r'iks* [L. *Eryx*, an opponent of Hercules, who slew him and buried him on a mountain, which retained his name. Various other classic men or myths]: in *zool.*, genus of snakes, family *Boidæ*. They are small in size, and have not the prehensile tail of the huge boas and pythons. They are found in India and the Eastern islands, and in Turkey, Greece, and Egypt.

ERZ'BERG: see **EISENERZ**.

ERZERUM, or **ERZROUM**, or **ERZRUM**, *ěrz-róm'*: province of Asiatic Turkey, in Armenia; bounded by Trebizond, Karpoot, Diarbekir, Van, Persia, and Transcaucasia; contains the sources of the Euphrates, Araxes, Koor, and Choruk rivers, and several chains of mountains, inhabited chiefly by Kurds; has a general elevation of 6,000 ft., and produces large quantities of fruits, rye, barley, flax, and grasses for sheep and cattle. Cap. and largest city in Armenia, E.—Pop. of province (1885) 645,702.

ERZERUM, *ěrz-zě-róm'*, or **ERZROUM**, *ěrz-róm'*, properly *Erserum*: strongly fortified town in Turkish Armenia, lat. 39° 55' n., long. 41° 20' e., not far from the n. source of the Euphrates. It is in a high, moderately well cultivated plain; 6,200 ft. above the sea. The climate is cold in winter, but dry in summer. E. is the residence of an English, a Russian, and a French consul; and its people carry on a brisk trade, and have attained a prosperity unusual in the East. The copper and iron wares of E. have wide celebrity. Situated at the junction of the important highways leading

ERZGEBIRGE.

from Trebizond, Transcaucasia, Persia, Kurdistan, Mesopotamia, and Anatolia, E. forms an entrepôt of commerce between Europe on one hand, and the interior of Asia, and particularly Persia, on the other. The streets, the houses of which are chiefly of volcanic stone cemented with mud, are narrow, crooked, and filthy; and ruins of fortifications and of buildings formerly magnificent, everywhere meet the eye. The town consists of the fortress, strictly so called, and four suburbs. The fortress, inclosed by a high wall, has, on the w., a citadel called Ijkaleh, with many curious monuments, and a mosque of Christian origin. The fortress also contains 15 mosques, the residence of the chief magistrate, some caravanseras, and a few elegant houses belonging to the higher order of officials and Mohammedan merchants. The suburbs have 24 mosques, several Armenian churches, and a number of large bazaars and caravanseras. E. imports shawls, silk goods, cotton, tobacco, rice, indigo, etc.; and exports corn, sheep, and cattle, horses, mules, and gall-nuts. The principal trades carried on are tanning, dyeing morocco, and blacksmiths' and coppersmiths' work. But since Russian Transcaucasia has provided a safe trade-route to Persia, the prosperity of E. has greatly suffered. E. is a very ancient town. Its Armenian name was *Garin Khalakh*. Near it stood the old Syro-Armenian town of Arsen. When the Seljuks captured this place, the inhabitants fled to a fortress at E., which the Seljuks accordingly called *Arsen-er-Rum*, i.e., Arsen of the Romans (or Byzantines), whence the modern Erzerum. In 1201 it fell into the hands of the Seljuks; of the Mongols 1242; and, finally, 1517, into those of the Turks. It however continued the most important city in the country, and at the commencement of the 19th c. had a pop. of 100,000. In the war of 1829, between the Turks and Russians, the taking of E. by the latter decided the campaign in Asia. E. was an important military centre during the war of 1877-8, and much hard fighting was done in its neighborhood. In 1877, Dec., the Russians closed round the city, already hard pressed, and reduced its defenders to the utmost distress: in 1878, Feb., it was surrendered to Russia. The Russians held it till 1878, Oct., when it was given up to the Turks.—Pop. est. (1870) 40,000 (of which Turks 30,000, Armenians 8,000, Persians 2,000); (1885) 60,000.

ERZGEBIRGE, *ërts-ga-bër'gêh* ('Ore Mountains'): chain of mountains, rich in metals, stretching s.w. on the confines of Saxony and Bohemia, from the valley of the Elbe to the Fichtelgebirge; long. 12° 20' e. In the s. it rises 2,000 to 2,500 ft., forming a steep wall of rock; in the w., it forms broad, slaty plateaux, and gradually slopes down toward the Saxon side to the level districts of Altenburg and Leipzig. In consequence of this formation, the streams flowing southward are small, while the n. side of the chain, which is well wooded, presents a series of romantic, and occasionally fertile and thickly peopled valleys, watered by the Mulde, the Pleisse, and their numerous tributaries. The town of Gottesgabe, a site the highest in Germany, is toward the s. of the E. range; long. 12° 54' e., at an eleva-

ESARHADDON—ESCALADE.

tion of 3,162 ft. The Keilberg, highest point of the range, is 3,802 ft. above the sea. The E. is chiefly of the gneiss-granite formation, in which most of the metal strata are to be found. Porphÿry and basalt likewise appear.

ESARHADDON, *ē-sar-hād'don*, King of Assyria: reigned B.C. 680-668; favorite son and successor of Sennacherib. He ascended the throne after two of his brothers had killed their father. He rebuilt Babylon and made it his southern capital; invaded Egypt, captured Memphis with all its treasures, and made the country as far as Thebes an Assyrian province; secured the n.e. frontier of his empire by an energetic campaign against the Minni and the Medes; penetrated to the heart of Arabia, and reduced a large number of native tribes to subjection; defeated the Cimmerians after checking their southward march, and drove them w. toward Sinope; subdued Cilicia, the Dahæ, and Eden; and was besieging Tyre when he died. He distinguished himself as an organizer and leader of armies; was mild and conciliatory in his civic administration; built or rebuilt vast palaces, fortresses, and temples, especially in Nineveh, Calah (Nimroud), and Babylon; and was succeeded by his son Asurbanipal, or Sardanapalus, whom he had associated with himself in the govt. on his return from the Egyptian campaign.

ESAU, *ē'saw* ('haïry' or 'rough'): eldest son of the patriarch Isaac, and twin-brother of Jacob. As E. grew up, he became 'a man of the field,' a cunning hunter, and his father's favorite. He seems to have been a wild, rough, hearty Bedouin, or son of the desert, thinking nothing of to-morrow, but living with joyous carelessness from day to day. This is apparent from the manner in which he allowed Jacob to defraud him of his birthright, though it carried with it, besides many temporal advantages, the Divine *Covenant-blessing* itself. After this transaction, E., when 40 years of age, married two Canaanitish women, 'which were a grief of mind unto Isaac and to Rebekah (Gen. xxvi. 35). Then follows the narrative of Jacob's personation of his brother, and his securing irrevocably the blessing to himself. E. now swore to kill his brother, whereupon Rebekah sent Jacob to his uncle Laban in Padanaram. E. next married his cousin Mahalath, daughter of Ishmael; and appears to have established himself in his wife's country, s. of Palestine in Mount Seir. Here he lived probably as a predatory chief. When Jacob was returning from Padanaram, E. encountered him with 400 of his Bedouins. The meeting was a touching one. The wild borderer at least was in earnest. 'Esau ran to meet him, and embraced him, and fell on his neck, and kissed him' (Gen. xxxiii. 4). His anger had long died out. E. next appears at the burial of his father Isaac, whom he seems to have loved with the warm and simple affection of a child of nature, and having obtained his share of the property, 'went into the country from the face of his brother Jacob' (Gen. xxxvi. 6). From E. the region of Mount Seir took the name of Edom (q.v.), and his posterity are generally called Edomites.

ESCALADE, n. *ēs'kū-lād'* [F. *escalade*—from It. *scalata*;

ESCALLONIA—ESCAPE.

Sp. *escalada*, an escalade—from L. *scālā*, a ladder: OF. *scalle*, a ladder]: the entering by troops into a fortified place by means of ladders: it consists in advancing over the glacis and covert-way; descending, if necessary, into the ditch by means of ladders; and ascending to the parapet of the curtain and bastions by the same ladders differently placed. A convenient form of ladders is in pieces of 12 ft. length, fitting end to end by means of sockets. A firing-party is usually told off, to keep down the fire of the enemy upon the escaladers, especially a flank fire lengthwise of the ditch, which might sweep them off with terrible rapidity. The leaders of an escalade constitute a 'forlorn hope.' ESCALADE, v. to enter a place by ladders. ES'CALA'DING, imp. ES'CALA'DED, pp.

ESCALLONIA, n. *ēs-kāl-lō'nĭ-a* [named after *Escallon*, Spanish traveller in S. America, who first found these plants in Guiana]: in bot., typical genus of the order *Escalloniaceae*. The species are S. American trees or shrubs, with dotted leaves and white, pink, or red whorled leaves.

ESCALLOP, n. *ēs-kāl'ōp* [see SCALLOP]: a bivalve shell; inequality of margin.

ESCALLOPÉE, a. *ēs-kāl'ō-pā* [F.]: in her., term applied to an escutcheon, etc., which is covered with curved lines, resembling the outline of a scallop-shell, and overlapping each other.

ESCALLOPED: see ESCALLOPÉE.

ESCAL'OP-SHELLS [see ESCALLOP], in Heraldry: denoting that the bearer has made many long voyages by sea. As the pilgrim's (q.v.) emblem, they were commonly given to those who had been to the Crusades; they came to be regarded as indicating either that the bearer or his ancestor had been a Crusader. The escalop-shell was the emblem of St. James the Great, and is generally seen in



Escalop-Shell.

churches dedicated to him. The more ordinary form of the name is SCALLOP-SHELL (q.v.).

ESCAPE, v. *ēs-kāp'* [OF. *eschaper*; F. *échapper*, to shift away, to slip out of: It. *scappare*, to run away: Gael. *sgap*, to scatter, to escape: Icel. *skreppa*, to slip away]: to flee from and avoid; to get out of the way without injury; to shun or evade; to pass without notice; to avoid an evil, as punishment; to shun danger or injury: N. a getting away from danger; flight; excuse; evasion; subterfuge. ESCA'PING, imp.: N. avoidance of 'danger. ESCAPED, pp. -*kāpt* ESCAPER, n. one who. ESCAPEMENT, n. that part of the machinery of a watch or clock by which the onward revolving motion produced by the moving power, whether weights or spring, is brought into contact with the regulating movement of the pendulum or balance-wheel: see HOROLOGY. ESCAPADE, n. *ēs-kā-pād'* [F.]: a mischievous freak; an impropriety of speech or slip of the tongue; the

ESCAR—ESCHATOLOGY.

gambols of a horse. ESCAPE WARRANT, warrant issued by a judge for the apprehension of persons who have escaped from certain prisons.—SYN. of 'escape v.': to avoid, elude; eschew, flee.

ES'CAR: see ESKAR.

ESCARP, v. *ēs-kârp'* [F. *escarper*, to cut to a slope—from It. *scarpa*, the scarp or slope of a wall]: to form a slope: N. in *fortification*, the side or steep slope of the ditch next the rampart, and of the parapet itself. When the ditch of a fortress is dry, the escarp is usually faced with masonry, to render it difficult of ascent; and behind this facing (*revêtement*) there are often passages or casemates for defense. In temporary fortifications, the *revêtement* is sometimes of wood; and in field-works, palisades at the foot, or fraises on the *berme* or edge of the ditch, are deemed sufficient. The escarp is always made at as large an angle as the nature of the soil will allow; the design being to offer the greatest possible obstacle to an assailant. ESCARP'ING, imp. ESCARPED', pp. *-kârp't'*, cut or formed to a sudden slope. ESCARP'MENT, n. *-mènt* [F.]: the steep face of a ridge of high land; ground about a fortified position cut away nearly perpendicularly to prevent the approach of an enemy.

ESCARTEL, v. *ēs-kâr'tèl* [F. *écarteler*, to quarter]: in *her.*, to cut or notch in a square form, or across.

ESCARTELÉE, a. *ēs-kâr'tèl-lū* [F.]: cut or notched in a square form, or across.

ESCAUT': see SCHELDT.

ESCHALOT, n. *ēs'h-ā-lōt'* [F. *échalotte*; OF. *eschāte*—from mid. L. *āscālōniā*], an edible bulb related to the onion; the *shalot*; the *Allium ascalonicum*, ord. *Liliacæ*.

ESCHAR, n. *ēs'kâr* [Gr. *eschairá*, a hearth, a scab: F. *escarre*]: in *med.*, a crust or scab, being a slough or portion of dead or disorganized tissue; usually produced artificially by application of caustics (q.v.). ESCHAROT'IC, a. *-kâr-ōt'ik*, having the power to sear or burn the flesh: N. a powerful caustic: see CAUSTIC.

ESCHARIDÆ, n. *ēs'châr'ī-dē* [L. *eschara*]: in *zool.*, family of polyzoa or bryozoa, sub-order *Cyclostomata*. The cœcnecium is erect and rigid, with the cells arranged quincuncially in a single plane on one or both sides of the frond; in *paleon.*, range in time from the Oolitic period till now.

ESCHATOLOGY, n. *ēs'kâ-tōl'ō-jī* [Gr. *eschâtōs*, extreme, last; *logos*, speech, discourse]: the doctrine of the four last or final things as regards man—viz., death, judgment, heaven, hell; included in these, or introduced by them, are the Millennium, and the Future Coming of Christ; the state of man, through a period more or less extended, immediately after death; the Resurrection through Christ; the Final Judgment as related to the End of the World; the ultimate delivering up of the kingdom of the Son of God to his Father: see HEAVEN: HELL: IMMORTALITY. ESCHATO

ESCHEAT—ESCHENBACH.

LOGICAL, a. *ěs'kū-tō-lāj' i-kāl*, pertaining to the last or final things.

ESCHEAT, n. *ěs-chēt'* [OF. *escheir*, to fall, to happen: *escheate*, the falling in of a property—from mid. L. *excadērē*, to fall upon, to meet—from L. *cādērē*, to fall]: lands or tenements which fall or revert to the lord or superior through failure of heirs, or by forfeiture; lands, etc., falling to the state through want of heirs, or forfeited by rebellion: V. to revert or fall to a superior, or to the state. **ESCHEAT'ING**, imp. **ESCHEAT'ED**, pp. **ESCHEAT'ABLE**, a. *-ā-bl*, liable to escheat. **ESCHEAT'OR**, n. *-er*, an officer who looks after escheats. **ESCHEAT'AGE**, n. *-āj*, the right to succeed to an escheat.—*Escheat* was an incident of the feudal law whereby, when a tenant in fee-simple died, leaving no heir capable of succeeding, the land reverted to his lord. According to the law of England, if the owner of an estate in fee simple dies without leaving an heir, and without having disposed of his estate by deed or will, the land reverts to the overlord, who in the present day is almost invariably the sovereign, except in copyhold estates, which escheat to the lord of the manor. The species of escheat in English law, under attainder for treason or murder, is to be distinguished from forfeiture of lands to the crown for treason, which prevailed in other countries besides England: see **FORFEITURE**.

In the United States the original and ultimate proprietor of all lands is the state in virtue of its sovereignty, and to it reverts the title of all lands which under the laws of England would go to the lord of the manor or to the crown. In most of the states E. is regulated by statute.

ESCHELLES, *ā-shēll'*, **LES**: village in Savoy (formerly a Sardinian, now a French state, on the Guier, 12 m. s.w. of Chambéry. The valley beyond this village and on the road to Chambéry is blocked up by a huge limestone rock 800 ft. high, over which travellers formerly used to climb by means of ladders, and hence the name given to this village. Through this mass of limestone the public road now passes in a tunnel 25 ft. high, 25 ft. wide, 1,000 ft. long. The tunnel was projected and commenced by Napoleon I., and finished 1817 by the king of Sardinia.

ESCHENBACH, *ěsh'en-bách*, **WOLFRAM VON**: celebrated poet of the middle ages; b. in the second half of the 12th c., of a noble family, which derived its name from the village of Eschenbach near Ansbach; d. between 1219 and 25. He received the honor of knighthood at Henneberg, and passed his life in knightly fashion. In 1204, he came to the court of Hermann, landgraf of Thuringia, where he shone among the poets of the time, at the so-called Wartburg-war (a rivalry of the German minstrels at Wartburg 1206 or 7). E. withdrew from the Thuringian court toward the close of his life. E.'s poems are partly original, partly after French and Provençal models. His rich fancy, deep sentiment, and vivid power of representation, as well as his elegant mastery of language and versification, give

ESCHER—ESCHWEGÉ.

something of an epic character to his works, the principal of which are *Parcival*, composed before 1212, *Wilhelm von Orange*, and *Titurcl*. Besides these, we have several love-songs of his. E. exercised an important influence on his time, but subsequently was almost forgotten; and it is only recently that he has been restored to his place of honor. The first critical edition of his works was that by Lachmann (Berl. 1833). They were translated into modern German by San-Marte (2 vols. Magdeb. 1836-41), and with greater accuracy, though with too slavish literalness, by Simrock (2 vols. Stuttg. 1842).

ESCHER, *ěsh'ěr*, JOHANN HEINRICH, ALFRED: 1819, Feb. 20—1883; b. Zurich: distinguished Swiss statesman. He studied at Bonn and Berlin. In 1842, he was created doctor of law at Zurich; and spent the two following years in Paris, devoting his attention chiefly to studies connected with Roman law. On his return to Zurich, E. became a lecturer on Swiss political law, in the High School. In 1844, he was elected member of the great council of the canton, and was drawn into the arena of practical statesmanship. His sentiments were decidedly liberal. In 1845, Jan., with six others who shared his opinions, he published the famous summons to the popular assembly in Unterstrass for the expulsion of the Jesuits. His election into the council of the interior 1845, and into the council of education 1846, opened a wide field for his administrative talents in his native canton. The reorganization of the schools is chiefly his work. In 1847, Dec., he became pres. of the great council; and in his opening speech, recommended the complete reform of the confederacy, and the greatest possible centralization. In 1848, he was sent as deputy to the federal diet, and became pres. of the council of regency; in 1849 pres. of the national council. Latterly he was engaged in promotion of railway enterprise and banking institutions in Switzerland.

ESCHEW, v. *ěs-chó'* [OF. *eschever*, to avoid; It. *schivare*, to avoid, to parry a blow; O.H.G. *sciuhan*, to frighten Sw. *skéf*; Dan. *skieve*, oblique]: to avoid; to flee from; to shun. ESCHEW'ING, imp. ESCHEWED, pp. *ěs-chód'*.

ESCHOLTZ BAY, *ěsh'olts*: portion of the Arctic Ocean in Alaska, the innermost part of Kotzebue Sound, first great inlet n. of Behring's Strait. It is about long. 161° w., being barely outside the polar circle. It has fossil remains, comparatively rare on that portion of the American continent, though common on the n. coast of Siberia.

ESCHSCHOLTZIA, n. *ěsk-shólt'zî-ă*: genus of plants of the nat. ord. *Papaveraceæ*, of which are *E. Californica* and other species, natives of California, very showy with their large deep yellow flowers. The genus is remarkable for the calyx, which separates from the dilated apex of the flowerstalk, being thrown off by the expanding flower, and much resembling in its form the extinguisher of a candle.

ESCHWEGÉ, *ěsh'vâ-gěh*: a town of Prussia, in the province of Hesse-Nassau, is situated on the left bank of the

ESCHWEILER—ESCUAGE.

Werra, 25 miles e.s.e. of Cassel. It consists of an old and new town, and a suburb; is surrounded with walls pierced by six gates; and is well built. The only building of note is the castle, which was long the residence of the landgrafs of Hessen-Rotenberg. E. has manufactures of woolen and linen fabrics, numerous tanneries, and several oil and other mills, also some trade in fruit and victuals. Pop. (1890) 9,776.

ESCHWEILER, *ěsh'vī-lér*: town of Rhenish Prussia, in the circle of Aachen, nine m. e.n.e. from the city of Aachen (Aix-la-Chapelle). It is a station on the railway between Aix-la-Chapelle and Cologne, at the confluence of the Inde and Dente. It has extensive manufactures of ribbons, woolens, canvas, needles, iron-wire, and machinery, also of wax-cloth, lace, glass, vitriol, and vinegar. In the vicinity are mines of zinc and lead. Pop. (1890) 18,119.

ESCLATTE, a. *ěs'klăt tū* [OF. pp. of *esclater*, to shiver]: in *her.*, term applied to anything shivered by a battle-ax.

ESCOBEDIA, n. *ěs-ko bē'dī-a* [named after *Escobedo*, a Spanish botanist]: in *bot.*, typical genus of *Escobediæ*, of the tribe *Scrophulariaceæ*, sub-order *Antirrhinidæ*.

ESCORT, n. *ěs'kört* [F. *escorte*—from It. *scorta*, a convoy, a guide—said to be from L. *ex-corrigere*, to set right: comp. L. *cohors*, a company of soldiers]: a body of armed men to attend or protect any person of distinction on a journey; a guard for the safety of baggage, etc. (see CONVOY): V. *ěs-kört'*, to attend as a guard on a journey; to accompany; to attend and guard anything conveyed by land. ESCORT'ING, imp. ESCORT'ED, pp. guarded on a journey or excursion; attended.

ESCOT, v. *ěs'köt* [OF. *escot*, payment of one's share of a common expense: Icel. *skot*; Scot. *scat*, a tax, money-payment]: in *OE.*, to pay a man's reckoning; to support; to pay. ESCOT'ING, imp. ESCOT'TED, pp. paid; supported: see SCOT.

ESCRITOIRE, n. *ěs'krī-tīrānr'* [OF. *escritoire*, an ink-stand—from mid. L. *scriptōriūm*, a writing-room or study]: a box or case with a desk and materials for writing; a writing-table or cabinet.

ESCROD, n. *ěs-kröd'*: a small cod broiled; a scrod.

ESCROL, n. *ěs-kröl'*: in *her.*, a scroll; a slip of paper, parchment, etc., on which the motto is written.

ESCUAGE, n. *ěs'kū-āj* [OF. *escusson*, diminutive of *escu*, a shield—from It. *scudo*; L. *scutum*, a shield]: literally, service of the shield; a commutation for the personal service of military tenants in war. ESCUTCH'EON, n. *-kūch'ūn*, the shield on which a coat of arms is represented; a hatchment; picture of the ensigns armorial. ESCUTCH'EONED, a. *-ūnd*, having an escutcheon or hatchment. *Note.*—The two sides of the front of a shield or escutcheon are named respectively the *dexter*, that is, the *right*, and the *sinister*, that is, the *left*, with reference to the right and left hand of the bearer. To the eye of the spectator they are of course exactly reversed.

ESCUDO—ESCURIAL.

ESCUDO, n. *ěs-kó'dō*: in *numis.*, Spanish coin containing ten reales. Ten escudos are equal to one pound sterling.

ESCUDO DE VERAGUA, *ěs-kó'do dū vā-rá'gwá*: river on the Atlantic side of Central America—having at its mouth an island of the same name. The river and island are a little e. of the boundary between New Granada and Costa Rica; the island in lat. 9° n., and long. 81° 30' w. The river, only 15 m. long, is noticeable only from the narrowness of the belt which here separates the Atlantic and Pacific.

ESCUAPIAN, a. *ěs'kū-lā'pī-ăn* [*Æscūlāpīūs*; Gr. *Asklēpiōs*, the god of the healing art in anc. mythology]: pertaining to the healing art; medical; also spelled *ÆSCULAPIAN*: see *ÆSCULAPIUS*.

ESCULENT, a. *ěs'kū-lěnt* [*L. escūlěntus*, fit for eating—edible—from *esca*, food]: good for food; eatable: N. some, thing that is eatable.

ESCURIAL, *ěs-kó-rē-ál'* (correct title, EL REAL SITIO DE SAN LORENZO EL REAL DE ESCORIAL): famous monastery of New Castile, province of Madrid, 30 m. n.w. of the town of Madrid. This solitary pile of granite has been called the eighth wonder of the world, and at the time of its erection surpassed every building of the kind in size and magnificence. It owes its origin (at least so it is said) to an inspired vow made by Philip II. during the battle of St. Quentin. On that occasion, he implored the aid of St. Lorenzo, on whose day, 1557, Aug. 10, the battle was fought; and vowed that, should victory be granted him, he would dedicate a monastery to the saint. The E. is built in the form of a gridiron, in allusion to the instrument of St. Lorenzo's martyrdom, and forms a huge rectangular parallelogram 744 ft. from n. to s., and 580 ft. from e. to w., and divided into long courts, which indicate the interstices of the bars. Towers at each angle of this parallelogram represent the feet of the gridiron, which is supposed to be lying upside down; and from the centre of one of the sides, a range of building abuts, forming the royal residence, and representing the handle. The E., begun 1563, finished 1584, was intended to serve as a palace, mausoleum, and monastery. It has a splendid chapel with three naves, 320 ft. long, and 320 in height to the top of the cupola. The *Pantheon*, or royal tomb, is a magnificently decorated octagon chamber, 36 ft. in diameter by 38 ft. high, in the eight sides of which are numerous black marble sarcophagi. Kings only and the mothers of kings are buried here. The E. is an immense building; it is stated that it has 14,000 doors and 11,000 windows, and its cost was 6,000,000 ducats. Its library, previous to the sack of the E. by the French 1808, contained 30,000 printed and 4,300 ms. vols. mainly treasures of Arabic literature, of which a catalogue, but not a good one, was drawn up by Casiri in his *Bibliotheca Arabico-Hispanica* (2 vols. Madrid 1760-70). They were, however, at that time, removed to Madrid; and on being sent back to the E., it was discovered that the library con-

ESCUTCHEON—ESDRAS.

sisted of only about 20,000 vols.—a third having been lost. The French also plundered the place of its valuable collection of coins, medals, and pictures. In 1872, Oct. 2, the E. was struck by lightning, and partially burned. The E. is saved from falling into ruin by occasional grants of public money.

ESCUTCHEON, see under ESCUAGE: in *heraldry*, synonymous with shield (q.v.).

ESCUTCHEON OF PRETENSE, or INESCUTCHEON, in Heraldry: a small shield placed in the centre of the larger one, and covering a portion of the charges on the latter, in which a man carries the arms of his wife when she is the heiress of her family. It is said to be carried *surtout*, or over-all. Sometimes also a shield over-all is given as an honor.

ESDRAËLON, *ēs-dra-ē'lon* [Greek form of the Hebrew Jezreel]: large and celebrated plain in central Palestine. It is triangular in shape with its apex toward the south near Jenin. From this point its eastern side, extending north about 15 m. and forming the watershed of the region, strikes the hills of Galilee two m. s.e. of Nazareth. Its n. side, inclining toward the s.w., is 12 m. long; and its s.w. skirting the hills of Samaria for more than 18 m., comes back to Jenin. From this main body three branches go out toward the e., the middle one of which is the valley of Jezreel, so famous in the history of Israel. The whole extent of the plain, naturally very fertile, is now a desolation. From the days of Barak and Sisera to those of Napoleon, it has been, because of its extent and central position, conspicuous as a thoroughfare for great armies, and as a fiercely contested battle-field; and for this reason it is, under one of its names—Megiddo—used in the book of Revelation as an emblem of the ground on which the final contest will be decided between the powers of light and darkness.

ESDRAS, *ēs'dras* or *ēz'dras*, Books of: portion of the Old Testament Apocrypha (q.v.). (The word *Esdras* is the Greek form of Ezra, and indicates that the books so named do not exist in Hebrew or Chaldee). In the Vulgate, the first book of Esdras means the canonical book of Ezra; and the second, the canonical book of Nehemiah; while the third and fourth are what we call the first and second books of Esdras. But in the Vatican and other editions of the LXX., what we call the first book of Esdras comes first, and is followed by the canonical book of Ezra, termed the *second* book of Esdras. In all the earlier editions of the English Bible, the order of the Vulgate is followed. The Geneva Bible was the first to adopt the classification now used, according to which Ezra and Nehemiah give their names to two canonical books, and the two apocryphal become first and second Esdras. As regards the *first* book of Esdras, it is for the most part a transcript—not very accurate—of Ezra and a portion of Nehemiah, together with the two last chapters of II. Chronicles. It is impossible to ascertain anything regarding its age or authorship. Josephus quotes it extensively in his *Antiquities*,

ESEMPLASTIC—ESK.

even when it contradicts *Ezra* proper, a fact which indicates that it was highly valued by the Jews. The hackneyed phrase, *Magna est veritas et prevalebit* (Truth is great, and will prevail), is taken from chap. iv., v. 41, of this book. The *second* book of Esdras, or Revelation of Esdras, is wholly different in character from the first, and it has even been doubted whether it is the work of a Jewish, or of a semi-Christian writer. Lawrence and Hilgenfeld argue for its being composed B.C. 28–25; Lücke, shortly after the death of Cæsar (B.C. 44); while Gfrörer, Bauer, and Wieseler assign it to a period as late as the reign of Domitian (A.D. 81–96). The opinion which has the weightiest evidence is, that the book was originally the composition of a Jew, but that it has been largely interpolated by Christian writers. The book was written probably in Egypt, and forms part of what has been called the 'Apocalyptic Cycle' of Jewish literature (see REVELATION OF ST. JOHN). It consists of a series of angelic visions and revelations made to Ezra, regarding the mysteries of the moral world, and the final triumph of the righteous, who, however, are to be but 'a very few.' The descriptions are occasionally very striking, and even sublime, and if the doctrinal portions contain the original views of a man living before the apostolic era, the source of the Pauline phraseology can in part be discovered.

ESEMPLASTIC, a. [Gr. *es*, into; *hen*, one; *plastikos*, molding, shaping]: molding; shaping; fashioning into one.

ESENBECKIA, *ēs-ēn-bēk'ī-a*: genus of trees of the nat. ord. *Diosmaceæ*. The bark of *E. febrifuga*, a tree 40 ft. high, native of the s. of Brazil, is said to be equal in its effects to Peruvian bark.

ESERINE, n. *ēs'ēr-in* [*eséré*, native name for the Calabar bean]: in *chem.*, physostigmin, $C_{15}H_{21}N_3O_2$; base contained in the Calabar bean. It is a yellow amorphous mass, very poisonous, causing contraction of the pupil of the eye.

ESK, *ēsk* (Gaelic, *uisg*, water): name of several small Scotch rivers. The Dumfriesshire Esk is formed by the confluence of the Black and White Esk, which rise near the centre of the Southern Highlands. The united stream runs 35 m. s., and forms for a mile the boundary between Scotland and England, and finally falls into the head of the Solway Firth. The upper part of the valley of this E., which is wild and pastoral, is called Eskdale Muir.—The Edinburghshire N. and S. Esk rise in the n. of Peeblesshire, between the Pentland and Moorfoot Hills, and both run n.n.e. through a beautiful tract in the east of Edinburghshire. The two branches unite in Dalkeith Park, and run into the Firth of Forth at Musselburg.—The Forfarshire N. and S. Esk rise in the Grampians; the N. flows 25 m. s.e. into the sea, 4 m. n. of Montrose. The S. Esk flows 40 m. s.e. and e., crossing the valley of Strathmore, passing Brechin, and ending in the tidal lagoon of Mont-

ESKAR—ESMARCH.

ESKAR, *ěs'kar*, or **ESKIR**, or **ESCAR**: term applied in Ireland to certain objects in the superficial drift, in several parts of that country; known also in Scotland as *kaims*, but more abundant in Sweden than in any other known country, being there recognized as *ösar*. An *eskar* is generally a long linear ridge of rounded gravel, chiefly of carboniferous limestone, including pieces of considerable size; in Sweden, they often have rough erratic blocks deposited upon them: they are sometimes heaped in narrow ridges 40 to 80 ft. high, and 1 to 20 m. long. It is an unsettled point whether they are connected with glacial action; if connected with it, the whole appearances and consistency demonstrate at least subsequent marine action. There is a remarkable *eskar* on a moor spreading below *Dirrington Law*, in *Berwickshire*, Scotland (900 ft. above the sea); another, about a mile long, has been pointed out amid a vast alluvial accumulation at *St. Fort*, *Fifeshire*. See **MORRAINE: GLACIER**.

ESKI-DJUMNA, *ěs'kě-jóm'ná*: town of the principality of Bulgaria, 20 m. w. of *Shumla*. Estimated Pop. 10,000.

ESKIMO, n. *ěs'kě-mō*: another spelling of **ESQUIMAUX**, which see.

ESKI-SAGRA, *ěs'kě-sá-grá*: town of European Turkey, province of E. Roumelia, at the s. base of the *Balkan Mountains*, 70 m. n.w. of *Adrianople*. In the vicinity are numerous gardens and orchards, also several mineral springs in great repute. The manufactures are carpets, coarse linens, and leather. Pop. 15,000 to 20,000.

ESLA, *es'lá*: river of Spain: important affluent to the *Douro*, rising in the province of *Palencia*, Old *Castile*, from the s. base of the *Asturias Mountains*, 10 m. n.w. of the town of *Valleburon*. Through its whole course, it flows s.w., and joins the *Douro* 15 m. below the town of *Zamora*; length 125 m. Its waters, which are joined by numerous streams, are well stocked with fish.

ESMARCH, *es'márch*, **JOHANNES FRIEDRICH AUGUST**: distinguished German surgeon; b. *Tönning*, *Schleswig-Holstein*, 1823, Jan. 9. He received his medical and surgical education in the Universities of *Kiel* and *Göttingen*, was attached to the *Kiel hospital* 1846, served through the *Schleswig-Holstein war* as army surgeon, and was taken prisoner with the greater part of the army 1848, Apr. 6. After being exchanged, he was appointed surgeon to the hospital of *Flensburg*, and in the following campaigns was aid to Surgeon *de Stromeyer*. In 1857, he succeeded *Stromeyer* as director of clinical surgery, and 1860 was appointed prof. and director of the *Kiel hospital*. In 1870 he was a member of the hospital commission of the *Prussian army*, and while his health would not permit him to accompany the army into France, he organized the general ambulance service, and the special hospitals at *Kiel*, *Hamburg*, and elsewhere. He also introduced a system of bloodless operations. After the war he returned to his duties at *Kiel Univ.* His first wife was daughter of Prof. *Stromeyer*, and his second the *Princess Henrietta* of

ESMERALDAS—ESOCIDÆ.

Schleswig-Holstein. In the autumn of 1888 he made a trip to the United States and performed a remarkable surgical operation in New York in the presence of some of the most distinguished surgeons in the country. He is author of numerous medical, surgical, and sanitary publications.

ESMERALDAS, *ēs-mā-rāl'dās* (Sp. for *Emerald*): province in the n.w. part of the state of Ecuador (q.v.), S. America; watered by the E. river. It is mostly covered with forests, but produces excellent cacao and tobacco. Pop. (1885) 11,146.

ESMERALDAS RIVER: rising near the city of Quito, in Ecuador, S. America; entering the Pacific after a course of 110 m.; lat. $1^{\circ} 5' \text{ n.}$, and long. $79^{\circ} 40' \text{ w.}$ —Ten m. from its mouth is the town of Esmeraldas; pop. abt. 4,000.

ESNÉ, *ēs'nā*, or ESNA, *ēs'na*, or ESNEH, *ēs'ně*, the hieroglyphic *Sen*, and the Greek *Latopolis* or *Lattónpolis* (the city of the Latus fish or *Latus nobilis*, from the fish there worshipped): thriving but badly built town of Upper Egypt, on the left bank of the Nile, lat. $25^{\circ} 15' \text{ n.}$ It has some manufactories of fine cotton, shawls, and pottery. It is an entrepôt for the Sennaar caravans. There are famous ruins at E., of a sandstone temple, with a portico of four rows of six columns, which appears to have been founded by Thothmes III., whose name is seen on the jambs of a door. The temple, however, seems to have been restored or principally constructed by Ptolemy Euergetes (B.C. 246–222), and the pronaos was erected in the reign of Emperor Claudius A.D. 41–54), and completed in that of Vespasian. The interior is of the date of Trajan, the Antonines, and Geta, whose name, erased or replaced by that of Caracalla, is there found. The great temple was dedicated to Chnumis, Satis, and Har-Hek. It has a zodiac like that of Denderah, formerly thought to be of the most remote antiquity, but now known to be no older than the Romans. A smaller temple with a zodiac, erected in the reign of Ptolemy Euergetes, formerly stood at E'Deyr, $2\frac{1}{2}$ m. n. of E., but it has been destroyed. At E. is also a stone quay, bearing the names of M. Aurelius. This city was the cap. of a nome, and the coins struck in it in the reign of Hadrian, A.D. 127–128, represent the fish *latus*.—Champollion, *Not. Descr.* p. 283; Wilkinson, *Mod. Egypt.* II., p. 268; Tochon d'Annecy, *Médailles*.—Pop. abt. 12,000, of which many are Copts.

ESNECY, n. *ēs'ně-sī* [F. *aînesse*, priority of birth]: in law, right, under some laws, of the eldest coparcener in the case where an estate descends to daughters jointly for want of an heir male, of making the first choice in the division of the inheritance.

ESO, pref. *ēs-ō* [Gr. *esō*, *eisō*, to, within, into]: within.

ESOCIDÆ, n. plu. *ēs-sōs'ī-dē* [L. *esōx*, or *esōcem*; Gr. *isox*, a species of pike]: family of malacopterous fishes; now regarded as including only the pikes (q.v.), but in which the flying fishes (*Elocatus*) and other fishes, now constituting the family *Scomberesocidæ* (q.v.), and of the order *Pharyngognaths*, were until recently included.

ESODIC—ESPALIER.

ESODIC, a. *ēs-ōd'ik* [Gr. *eis*, into; *hodos*, a way]: in *phys.*, conducting influence to the spinal marrow. (Used of the nerves which have this function.)

ESOENTERITIS, n. *ēs-ō-ēn-tēr-i'tis* [pref. *eso-*; Eng. *enteritis*]: in *pathol.*, inflammation of the mucous membrane of the intestines.

ESOGASTRITIS, n. *ēs-ō-gās-trī'tis* [pref. *eso-*, Eng. *gastritis*]: in *path.*, inflammation of the mucous membrane of the stomach.

ESOPHAGUS, n. *ē-sōf'ā-gūs*: the passage through which food and drink pass to the stomach; the gullet. Spelled also **ŒSOPHAGUS** (q. v.).

ESOPIAN, a. *ē-sō'pī-ān* [from *Æsop*, an anc. Greek who wrote fables]: composed by *Æsop*; after the manner of *Æsop* (q. v.).

ESOPUS, *ē-sō'pūs*: original name of the settlement at or near what is now the city of Kingston (q. v.), N. Y.—**ESOPUS WAR**, a series of conflicts at E. between the Dutch settlers and the Indians, 1658-64; ending in the burning of the village of Wietwyck, the killing of 21 settlers, and the captivity of 40 women and children.

ESOTERIC, a. *ēs-ō-tēr'ik* [Gr. *esōtērīkēs*, belonging to what is interior or abstruse—from *ēsō*, within]: term derived from the anc. mysticism, denoting private; secret; pertaining to doctrines taught in private only to the initiated; opposed to *exoteric*, denoting the form of such doctrines taught to the public. **ES'OTER'ICAL**, a. *-i-kāl*. **ES'OTER'ICALLY**, ad. *-lī*. **ES'OTER'ICS**, n. plu. *-īks*, mysterious or hidden doctrine.

ESPADON, n. *ēs'pā-dōn* [It. *spadone*, a two-handed sword—from *spada*, a sword]: a long heavy sword wielded by a powerful foot-soldier, or used in decapitating by an executioner.

ESPALIER, n. *ēs-pāl'yēr* [F. *espalier*, railing on which fruit-trees are trained as though against, or actually against a wall—from It. *spalliera*, the back of a chair, an espalier: Sp. *espaldera*, wall-trees—from *espalda*, a shoulder]: railing or trellis on which fruit-trees are trained in a row. By allowing the air and sunlight to pass freely among the leaves this system promotes early ripening of the fruit, prevents injury to the branches and loss of immature fruit from winds, and requires but little land. It is nearly equal to wall training for which it is an excellent substitute. The apple, pear, peach, and nectarine, are most frequently grown in this manner. A common method is to nail slats or wires to a line of posts and close to these set a row of very small trees. Shoots which are form to the arms of the trees are tied to the trellis in the desired position. Fruit is produced on the short laterals which are allowed to grow from these arms. In the case of trees which produce fruit on new wood, a succession of laterals is secured by skilful pruning, the old ones being removed after fruiting. The arms are trained in a horizontal position, in the style of a fan, or of a wine glass, and in various other artificial forms.

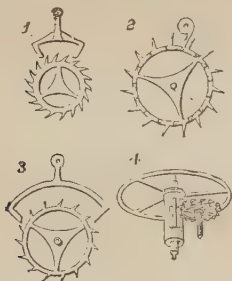
ESPARTERO.

In the oblique rod system the stem is trained at an angle of about 45 degrees, while the oblique double rod method allows two branches, which are bent in a similar manner. The flow of sap is thus retarded, productiveness is increased, and the quality of the fruit improved. In the cordon, or hedge-row method, the trees are set only 16 inches apart, trained to a trellis, and very closely pruned. An inclined trellis is frequently used where special protection from cold is desired. The espalier, common in Europe, has been used in this country only in growing very tender varieties and for ornamental purposes. See FRUIT: FRUIT-GARDEN: ORCHARD-HOUSE.

ESPARTERO, *és-par-tā'rō*, JOAQUIN BALDOMERO: Ex-regent of Spain, Count of Luchana, Duke of Vittoria, etc.: 1792-1879, Jan.; b. Granatula, in La Mancha (Ciudad Real), where his father, Antonio E., was a cartwright. E. was intended for the ecclesiastical profession, and in 1806 went to the Univ. of Almagro, but two years later, on the invasion of Spain by the French, he entered the Sacred Battalion (*Butallon Sagrado*), composed almost entirely of students. After the close of the War of Independence 1814, he went to S. America, where he fought against the insurgents; but after the victory by Bolivar at Ayacucho, 1824, Dec. 9, had put an end to the Spanish rule on the continent of America, E. returned to Spain. In 1832, he declared himself openly in favor of the succession of the daughter of Ferdinand VII.; and on the breaking out of the civil war after the king's death, he soon rose to the rank of lieut.gen. In 1836, Aug., he succeeded in saving the city of Madrid, and became successively gen.-in-chief of the army in the north, viceroy of Navarre, and capt.gen. of the Basque provinces. When the army of Don Carlos appeared before Madrid, 1837, Sep. 12, E. had again the glory of saving the capital. His successful campaign, 1839, which resulted in the expulsion of Don Carlos from Spain, procured him the title of Grandee of Spain, and Duque de la Vittoria y de Morella. In 1840, the queen-mother Christina was compelled to resign her office of regent, and 1841, May 8, E. was appointed by the cortes to supply her place until the queen (Isabella) should have reached her majority. E. guided the helm of the state with energy, firmness, and ability; but in 1843, an unscrupulous and unprincipled combination of parties naturally inimical to each other, the republicans and the moderados, brought about his fall, and E. sailed for England, where he resided four years. In 1847, he returned to Spain, and lived quietly at Logroño till 1854, when the wretched despotism and profligacy with which the name of Christina is associated, caused an insurrection of the people, and compelled the queen-mother to leave the kingdom. E. was again called to the head of the govt., and conducted the affairs of the nation for two years; but 1856, July, he was supplanted by General O'Donnell. In 1857 he resigned his dignity as senator, and after that time rarely took part in politics. After the revolution 1868, which resulted in the expulsion of Queen Isabella, E. gave his full and hearty adhesion to the



Erodium: 1, Stamens and Styles.



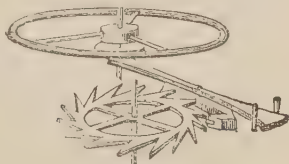
Watch and Clock Escapements:
1, Anchor escapement of a common clock; 2, Duplex escapement; 3, Lever escapement; 4, Horizontal or cylinder escapement.



Esparto Grass (*Stipa tenacissima*).



Escallopée.



Escapement.



Escutcheon of Elizabeth, Queen of Henry VII.

ESPARTO—ESPINEL.

provisional government, though he took no part in their proceedings. In 1870, E. was induced to become a candidate for the throne of Spain; but withdrew in June of the same year, alleging his age and the division of parties as excuse. In 1875 he adhered to King Alfonso.

ESPARTO, n. *ès-pâr'tō* [Sp. *esparto*—from L. *spartum*; Gr *sparton*, Spanish broom], (*Stipa* or *Macrochloa tenacissima*): species of grass nearly allied to the well-known and beautiful feather-grass (q.v.), native of the s. of Europe (especially Spain) and n. Africa. It is used by the Spaniards for making sandals, nets, sacks, etc.; and has become an important material in paper-making. As supplies for this purpose have fallen off of late through the reckless custom of tearing up the grass by the roots, attention has been directed to various substitutes, including what has been called Irish esparto (*Molinia cerulea*), which grows wild on Irish waste land.

ESPATHATE, a. *è-spā'thāt* [L. *e*, out; *spatha*, the spathe of a palm-tree]: in *bot.*, not having a spathe.

ESPECIAL, a. *ès-pěsh'āl* [OF. *especial*—from L. *speciālis*, not general—from *speciēs*, a kind: It. *speciale*: F. *spécial*]: chief; principal; particular. **ESPE'CIALLY**, ad. *-lī*, principally; particularly; in an uncommon degree above any other. **ESPE'CIALNESS**, n.

ESPEJO, *ès-pā'chō*: small town of Spain, 20 m. s.e. of Cordova. It has an ancient castle. Pop. 5,284.

ESPERANCE, n. *ès-për-āns* [F. *espérance*, hope—from *espérer*, to hope—from L. *spērārē*]: in *OE.*, hope; expectation.

ESPIED, **ESPIAL**, **ESPIER**: see under **ESPY**.

ESPINASSE, *ès-pě'nās'*, **JULIE JEANNE ELEONORE DE L'**: one of the most fascinating women of her time, combining sparkling gifts with an affectionate disposition: 1732, Nov. 19—1776, May 23; b. Lyon, France; illegitimate daughter of a Mme. d'Albion. After the death of her mother, Mlle. de l'E., who had received an excellent education, went, as *gouvernante*, to the house of her brother-in-law, the Marquis de Vichy-Chamrond. In 1752, she went to Paris as *demoiselle de compagnie* to the Marquise Du Deffand (q.v.). The two ladies lived together agreeably, until a rupture resulted from the admiration which the young and beautiful *demoiselle* attracted from the circle in which Du Deffand had formerly been the chief attraction. Even D'Alembert, the famous encyclopédist, hitherto the most constant admirer of Du Deffand, gave his devotion to the more fascinating Espinasse. The friends of E. obtained for her, through the Duc de Choiseul, an annuity from the king. It is said that D'Alembert sought her hand in vain. Her *Lettres*, etc. (Paris 1809), show her remarkable cultivation.

ESPINEL, *ès-pě-nèl'*, **VINCENT DE**: 1551, Dec. 28—1634; b. Ronda in Granada: Spanish poet and musician. He studied at Salamanca, afterward entered into the army, and travelled as a soldier through Spain, France, and Italy.

meeting with the adventures which he relates in his *Relaciones de la Vida y Aventuras del Escudero Marcos d, Obregon* (Madr. 1618, later 1804; in German, by Tieck-Bres. 1827). He afterward returned to his native country, entered into holy orders, and received a benefice in Ronda, his native town. He was subsequently chaplain in the royal hospital at Ronda. The last years of his life were spent at Madrid, in the retirement of the monastery of *Santa Catalina*, where he died. He published a book of poems (Madr. 1591), chiefly lyrics, and a translation of the *Epistola ad Pisones*, the *Ars Poetica* of Horace. He was, if not the inventor, the improver of the ten-line octosyllabic stanza. Verses in this form have, since E.'s day, been called in Spain *Espinelas*. He was a performer on the guitar, to which he added the fifth string.

ESPINHACO, *ēs-pēn-yā'so* (SERRA DO): mountain-chain of Brazil, extends in a direction generally parallel with the coast, from the right bank of the San Francisco to the head-waters of the Uruguay. Its n. part forms the e. limit of the basin of the former river. The Serra, as a whole, is said to be rich in diamonds.

ESPIONAGE. n. *ēs-pī-ō-nāj'* or *-nāzh* [*espionnage*, act of spying—from *espion*, a spy—from It. *spione*]: the practice of watching the words and conduct of others, generally from unworthy motives; the practice of employing others as spies or secret agents.

ESPIRITU SANTO, *ēs-pī-rī-tō sán'tō* or *ēs-pē-rī-tō sán-tō* (long applied by the Spaniards to their imaginary continent in the s. hemisphere): largest and most westerly island of the New Hebrides, lat. 15° s., and long. 167° e.; said to measure 80 m. by 40.

ESPIRITU SANTO: cape of Tierra del Fuego, lat. 52° 38' s., long. 68° 37' west.

ESPIRITU SANTO: bay of the Gulf of Mexico, forming part of the almost continuous back-water of Texas; lat. 28° 30' n., and long. 97° 30' w. Toward the open sea, it is breasted by Matagorda Island, and on the side of the mainland, it receives the Guadaloupe.

ESPIRITU SANTO: small maritime province of Brazil, extending in s. lat. 18° 30' to 21° 20'; immediately n. of the metropolitan province of Rio Janeiro. It contains also a town and a bay of its own name. Pop (1888) 121,562.

ESPIRITU SANTO: town near the centre of Cuba; pop. 9,982, fully one half being whites.

ESPLANADE, n. *ēs-plā-nād'* [F. *esplanade*, a planing, a levelling—from It. *splanata* for *spianata*, a levelled way—from L. *plānūm*, level ground, a plain]: level ground within a fortified place or adjoining it, used for exercise, etc.; properly, the space between the fortifications or of the town and the glacis of the citadel. It requires to be at least 800 paces broad, that the enemy, in case of his getting possession of the town, may not be able to assail the citadel under cover of the nearest houses. For this purpose, the citadel must command the esplanade, and be able to send a direct fire into the streets opening upon it.—In old works

ESPOUSE—ESPY.

on fortification, the term is often applied to the glacis of the counterscarp, or the slope of the parapet of the covered way toward the country.

ESPOUSE, v. *ès-pouz'* [F. *épouser*; OF. *espouser*, to wed: OF. *espouse*, a spouse, a wife—from L. *sponsa*, a betrothed one; *sponsus*, promised solemnly]: to promise or engage in marriage by a written contract; to betroth; to marry; to embrace or adopt, as a cause or opinion. **ESPOU'SING**, imp. **ESPOUSED'**, pp, *-pouz'd*, married; wedded. **ESPOU'SAL**, a. *-zâl*, relating to the act of espousing: N. act of espousing or betrothing; adoption. **ESPOU'SALS**, n. plu. *-zâlz*, the act of contracting a man and a woman to each other in marriage. **ESPOU'SER**, n. *-zer*, one who. **ESPOUSE'MENT**, n. *-pouz'mènt*.

ESPRINGAL, *ès-prîng gal*, or **SPRINGAL**, *spring'gal*: in *milit. eng.* before the days of gunpowder, a machine for throwing missiles. These missiles were either large darts, called *muchettes*, or arrows winged with brass and called *viretons*, from their whirling motion when shot forth. The espringal probably resembled in some degree the machine engraved in **BALISTA**.

ESPRIT, n. *ès-prê'* [F. *esprit*, spirit—from L. *spiritus*, spirit]: spirit; soul. **ESPRIT DE CORPS**, *-dê kôr'* [F. *esprit*, spirit *de*, of, *corps*, body]: the prevailing spirit or disposition which binds men as members of the same society or profession.

ESPRIT D'IVA, *ès-prê' dê-vâ*: aromatic liqueur made in Switzerland, from a plant called **GENIPE** (*Achillra moschata*, or *Plarmica moschata*; see **ACHILLEA**). Like the *Swiss tea*, made from the same plant, it has sudorific properties.

ESPY, v. *ès-pî'* [F. *épier*; OF. *espier*, to watch—from It. *spiare*, to spy]: to see a thing at a distance; to discover something meant to be concealed or not very visible. **ESPY'ING**, imp. **ESPIED'**, pp. *pid'*. **ESPI'ER**, n. one who. **ESPI'AL**, n. the act of spying; in *OE.*, a spy; a scout. **ESPIONAGE**, n. which see.—**SYN.** of 'espy': to discern; to spy; descry; discover; find out; perceive; watch; observe.

ESPY, *ès'pî*, **JAMES P.**: meteorologist:1785 (May 9)-1860, Jan. 24; b. in w. Penn.; son of a farmer. He received a superior education, and was a classical and mathematical instructor in Philadelphia; but became enthusiastic in meteorology, and gave up teaching. His first course of lectures was before the Franklin Institute of Pennsylvania. E.'s theory of storms (with which his name is specially connected) drew general attention: see **STORMS**. His memoir on this subject gained 1836, the Magellanic premium of the American Philosophical Soc. of Philadelphia. In 1841 appeared his work on the *Philosophy of Storms*, regarding which the Report of the *Académie des Sciences* (Paris) says, 'that the theory on which it is based alone accounts for the phenomena. . . . It redresses many accredited errors.' Later in his life, E. became prof. in the Philadelphia High School, and afterward in the Franklin Institute. He travelled extensively through the United States, lecturing on his favorite theory of storms, and studying the laws of climate, until he acquired the popular title of the 'Storm-

ESQUIMALT—ESQUIMAUX.

king.' After the organization of the Smithsonian Institution at Washington, he was commissioned by Dr. Henry, its superintendent, to pursue his researches. In the halls of the Smithsonian were made his experiments on the rate of cooling of gases of different densities when expanded. The cooling effects of expansion on dry and moist air also formed the subject of nice experiments. The results of these experiments have thrown much light on the formation of cloud and rain, and the propelling power of winds. They afforded materials for his elaborate and valuable reports on meteorology, of which the last was issued 1857. He died in Cincinnati.

ESQUIMALT, *ès'ké-mált*: small port at the s. end of Vancouver Island, on Juan de Fuca Strait; important as a British naval depot, the only one on the w. coast of the American continent. See **VICTORIA** (city in Brit. Col.).

ESQUIMAUX, n. sing. or plu. *ès'kè-mō* [a French spelling of a native name, *eskumaget*, he eats raw flesh—a nickname given to the Arctic tribes by the N. Amer. Algonquin Indians]: tribes of diminutive stature inhabiting the northern seaboard of America and Asia, and the Arctic islands: **ESQUIMAU**, as a sing. form, is rarely used. **ESKIMO**, *ès'kè-mō* (also **ESKIMOS**), is a common spelling, and adopted in Greenland. They are found on the coasts of all the seas, bays, inlets, and islands of America n. of the 60° of n. lat.; from the e. coast of Greenland, long. 20°, to the Strait of Behring, long. 167° w. On the Atlantic, they are found along the entire coast of Labrador to the Strait of Belleisle, and down the e. side of Hudson's Bay nearly as far as James's Bay; while on the Pacific they reach as far as the peninsula of Alaska. They are found also on the Asiatic side of Behring's Strait, and though few in number, may be regarded as the most widely spread nation in the world, occupying, according to Mr. Gallatin, not less than 5,400 m. of coast, without including the inlets of the sea. 'The Eskimo,' says Dr. Latham, 'is the only family common to the old and new world—an important fact in itself, and one made more important still by the Eskimo localities being the only localities where the two continents come into proximity.' Nothing, however, has as yet come out of a consideration of this fact in the way of tracing, with absolute certainty, a connection between the E. and any well defined Asiatic race. The name itself, *Esquimaux*, or *Eskimo*, does not help in any such attempt, being not the native name, for they called themselves 'Inuit,' or 'people;' the Scandinavians of the 10th c. called them 'Skroellingar,' or 'wretches;' while the seamen of the Hudson's Bay ships designate them as 'Seymos,' or 'Suckemos,'—appellations, according to Richardson, 'evidently derived from the vociferous cries of Seymour or Teymo with which the poor people greet the arrival of the ships.' The E. are usually reckoned by ethnologists to belong to the Mongolian race, but Duponceau and Gallatin find a strong resemblance between them and the Red Indians of N. America, the view also of Prichard—the

ESQUIMAUX.

last mentioned regarding them as a kind of link between the N. Asiatic and American family of nations. Latham, on the other hand, pronounces them Mongolian in physiognomy, with flat nose, projecting cheek-bones, eyes often oblique, and skin more brown than red or copper colored; thus presenting a marked contrast to the N. American Indians. Their language, however, is, he acknowledges, American in grammatical structure, being composed of long compound words, and regular, though remarkable, inflections. With respect to the complexion of the E., Sir John Richardson is of a different opinion from any of these authors, describing it as nearly white, when relieved from the smoke and dirt with which it is usually incrustated. Many of the young women, he considers, may even be called pretty, when this operation has been performed. 'The young men,' he says, 'have little beard; but some of the old ones have a tolerable show of long gray hairs on the upper lip and chin, which the Red Indians never have, as they eradicate all stray hairs. The Eskimo beard, however, is in no instance so dense as a European one.' In stature, the E. are usually represented as not more than five ft. in height; but the authority just mentioned describes them as ranging from five ft. to five ft. ten inches, and even more. They are broad-shouldered, and, when seated in their boats, look tall and muscular, but, when standing, appear to lose some of their height, from the shortness of their lower extremities. The E. live usually throughout their long lines of coast in small villages, containing about five or six families each. The men occupy themselves entirely in hunting, while the women perform the domestic drudgery, which consists principally in preparing the food, of which both sexes consume a large quantity. This is almost entirely of an animal nature, but not without variety, embracing the reindeer, geese, and other birds, the seal, walrus, salmon-trout, and various other fish. They are expert hunters and fishers, and, aided by their dogs, make considerable havoc among the arctic animal tribes. Where whales are common, August and September are devoted to the pursuit of these animals, and great joy is manifested when they capture any of them, as from the blubber of these they get their supply of oil for lights in the long winter season. Of vegetables, they scarcely taste except in autumn. 'Carbon is supplied to the system by the use of much oil and fat in the diet, and draughts of warm blood from a newly killed animal are considered as contributing greatly to preserve the hunter in health.' The habits of the E. are filthy and revolting in the extreme. A great part of their food is consumed without any attempt at cooking it, and they drink the blood of newly killed animals as the greatest delicacy. In the short summer, those who can afford it live in tents; but in the winter they all equally live in snow-huts, the stench of which, from the offal with which they are stored, and the filthy oil that gives them light, makes them insupportable to the European. The dress of both sexes is nearly the same, consisting of the skins of animals, rein

ESQUIMAUX DOG—ESQUIRE.

deer, birds, and even fish—whatever conduces most to warmth, without much regard to appearance; but in their winter abodes they usually wear nothing except trousers. Their religion consists principally in superstitious observances, but they believe, we are told, in two greater spirits, and many lesser ones. The Moravian mission in Greenland, commenced by the benevolent Hans Egede (q.v.), 1721, has succeeded in converting many to Christianity; and they are represented by the missionaries to be a mild and teachable people, easily led by kindness to distinguish between what is morally right and wrong. Where the missionaries, however, have not penetrated, arctic voyagers generally speak of them as honest among themselves, but incorrigibly dishonest, and prone to lying and exaggeration with strangers.—See Dr. Rink's *Tales and Traditions of the Eskimo*.

ESQUIMAUX' DOG: kind of dog extensively spread over the most northern regions of N. America and of e. Asia; large, powerful, with long rather curling hair, tail much curved over the back and very bushy, short and pointed ears, and somewhat wolf-like aspect. These dogs are much used for drawing sledges. They are very saga-



Eskimaux, Dogs, and Sledge for one person.

cious, docile, and patient. The color is generally black and white, brown and white, or dingy white.

ESQUIRE, n. *ēs-kwīr'* or *ēs'kwīr* [F. *écuyer*; OF. *escuyer*, one who attended on a knight and bore his lance and shield—from It. *scudiere*—from L. *scūtārius*, the shield-bearer—from *scūtum*, a shield]: in *chivalry* the shield-bearer or armor bearer to the knight, and hence was called *armiger* in Latin. He was a candidate for the honor of knighthood, and thus stood to the knight in the relation of a novice or apprentice, much as the page did to him. In this capacity he was spoken of as a bachelor, just as the knight-bachelor came latterly to be distinguished from him who had already attained to the higher honors of chivalry. When fully equipped, each knight was attended by two esquires. The

ESQUIROL—ESQUIROS.

esquire was a gentleman, and had the right of bearing arms on his own shield or escutcheon, which is surmounted by a helmet placed sideways, with its vizor closed, to distinguish him from a knight or nobleman. He had also the sword, the emblem of chivalry, though he was not girded with the knightly belt. His spurs were silver, to distinguish them from the golden spurs of the knight; and when the king created esquires of old, it was by putting silver spurs on their heels, and collars of SS round their necks. Those who received this honor directly from the sovereign were in general the esquires for the king's body, or those whose duty it was to attend him in his capacity of a knight; an office now nearly obsolete. Tenants of the crown who held by knight's service were a class of feudal esquires generally supposed to correspond to the simple *ritters* or knights of Germany, as opposed to the *ritters* who were *geschlagen* or dubbed, inasmuch as these English esquires were entitled to claim the rank of knighthood. Though the title of esquire has now come to be given almost without discrimination, the following seem to be those whose claim to it in Britain stands on the ground either of legal right or of long-established courtesy: 1. All the untitled sons of noblemen; 2. The eldest sons of knights and baronets; 3. The sons of the younger sons of dukes and marquises, and their eldest sons. All these are esquires by birth. Then there are esquires by profession, whose rank does not descend to their children; and esquires by office—e. g., justices of the peace—who enjoy the title only during their tenure of office. To the former class belong officers in the army and navy, barristers and doctors of law, and doctors of medicine, but not surgeons.

ESQUIROL, *ès-ke-rol'*, JEAN ETIENNE DOMINIQUE: 1772, Jan. 4—1840, Dec. 12; b. Toulouse: one of the greatest physicians for the insane of modern times. He served in the military lazaretto at Narbonne 1794, obtained his degree of doctor 1805, and was appointed physician to the Salpêtrière at Paris 1811. After 1817, he delivered clinical lectures on the diseases of the mind, and their cures; in 1818, his exertions secured the appointment of a commission, of which he became a member, for the remedy of abuses in mad-houses; in 1823, he became inspector-gen. of the univ.; and in 1825, first physician to the *Maison des Aliénés*. In the following year, he was appointed also principal physician of the private lunatic asylum at Charenton, which he had organized. At the July revolution, he lost all his public offices, and withdrew into private life. E. combined rare qualifications for a physician of the body and the mind. By his humane and moral treatment of the insane, he often effected the happiest cures. His writings embrace all the questions connected with the treatment of insanity, and his special attention was given to the construction of suitable buildings for the insane. His most important work is *Des Maladies Mentales considérées sous les Rapports, Médical, Hygénique et Médico-légal* (1838).

ESQUIROS, *ès-ke-rōs'*, HENRI ALPHONSE: 1814—1876,

ESS—ESSAAD-EFFENDI.

May 13; b. Paris: poet and romancist; representative in the national assembly. He made his *début* as an author 1834, with a vol. of poems, *Les Hirondelles*, highly praised by Victor Hugo, but having a very limited sale. Two romances followed. *Le Magicien* (1837) and *Charlotte Corday* (1840). About this time he published a philosophic commentary on the life of Christ, the *Évangile du Peuple* (1840), for which he was prosecuted, and sentenced to eight months' imprisonment and to a fine of 500 francs, 1841, Jan. 30. In the same year he published his *Chants d'un Prisonnier*. His *Histoire des Montagnards* appeared 1847. After the revolution of 1848, Feb., E. was elected a member of the legislative assembly. Distinguished by his radical opinions, he was included, after 1851, Dec. 2, among members to be expelled; on which he retired to England. His *La Vie Future au Point de Vue Socialiste* appeared 1857; and *La Morale Universelle L'Angleterre et la Vie Anglaise*; and *La Hollande et la Vie Hollandaise*, 1859. In 1869, he was returned to the corps législatif, and was appointed supreme administrator of dept. Bouches de Rhône by the govt. of the National Defense 1870. In 1871 he was returned to the national assembly, and 1876, Jan., was made a member of the senate. He died at Versailles.

ESS, *es*, HEINRICH LEANDER VAN, or JOHANN HEINRICH VAN: 1772, Feb. 15—1847, Oct. 3; b. Warburg, Westphalia: German Rom. Cath. theologian. He joined the Benedictine order in Paderborn 1790, was ordained priest 1796, was pastor at Schwalenberg 1799—1813, and prof. extraordinary of theol. at Warburg Univ. 1813—22. In conjunction with his cousin Karl van E. he published a German translation of the New Test. (Brunswick 1807; 20th ed. Sulzbach 1830), and independently one of the Old Test. 1819. In order to encourage the reading of the Bible by German Rom. Catholics, he prepared a large number of translations, tracts, and essays; but this course was censured by the German Rom. Cath. bps. and the pope, and this led him to resign his professorship and enter on a life of seclusion. After his death his library of between 13,000 and 20,000 vols., rich in early editions of the Bible and mediæval and reformation literature, was bought for the Union Theol. Seminary (Presb.), New York.

ESSAAD-EFFENDI, MOHAMMED: Turkish historian; b. Constantinople, 1790, Dec. 16. He was surnamed Sahaf-Zadeh, 'son of the bookbinder,' on account of his father having been president of a corporation of bookbinders and librarians. At the age of 18, he became a teacher; in 1825, he was appointed historiographer to the Ottoman empire. In 1831, the superintendence of the *Tatawin-i-arekaii* (Table of Events), the official journal of the empire, was placed in his hands. In 1835, he was employed by the late Sultan Mahmoud on an embassy to Mohammed, son and successor of the king of Persia. E. had also the titles of grand judge of Roumelia, inspector-gen. of schools, and member of the council of public instruction.

Among the works of E. are *Uss-i-Tzafer* (Establishment

ESSAY—ESSEN.

of Victory), translated into French, published by M. Causin de Perceval, entitled *Historic Summary of the Destruction of the Janizaries by the Sultan Mahmoud in 1826* (Par. 1833).

ESSAY, n. *ès'sā* [F. *essayer*, to try—from L. *exāgĭum*, a trial of exact weight, proof by examination: F. *essai*, an essay, a sketch]: an attempt; an endeavor; an effort; a trial or experiment; a written composition on a practical subject, less formal or extended than a *treatise*. **ESSAYIST**, n. *-ist*, writer of an essay: V. *ès-sā'*, to attempt; to try; to endeavor. **ESSAYING**, imp. **ESSAYED**, pp. *-sā'd'*. **ESSAYER**, n. one who. *Note*.—**ESSAY** and **ASSAY** are radically the same word.—**SYN.** of 'essay, n.': exertion; experiment; effort; treatise; tract; dissertation; disquisition; monograph.

ESSAYS AND REVIEWS: title of a volume published London, 1860, Mar., written by seven prominent members of the Church of England, in more or less opposition to the Tractarian principle of Oxford. They may be deemed representative of the 'Broad Church' views. It was severely censured by the majority of the bps. and a large number of the clergy, and was condemned by a convocation 1864, June 24. In the meantime two of its authors (Rev. Dr. Williams and Prof. Wilson) were tried by ecclesiastical courts and sentenced to suspension for a year and the payment of costs; but the sentences were subsequently reversed by the privy council. A third, Rev. Dr. Temple, was strongly opposed by the English Church Union when nominated to be bp. of Exeter, 1869, Oct., but ineffectually. The E. and R. were: *The Education of the World* by Rev. Dr. Frederick Temple; *A Review of Bunsen's Biblical Researches*, Rev. Dr. Rowland Williams; *The National Church*, Prof. Henry B. Wilson; *The Interpretation of Scripture*, Prof. Benjamin Jowett; *Tendencies of Religious Thought in England, 1688-1750*, Prof. Mark Pattison; *On the Study of the Evidences of Christianity*, Prof. Baden Powell; and *The Mosaic Cosmogony*, Charles Wycliffe Goodwin (layman).

ESSEG: see **ESZEK**.

ESSEN, *ès'sèn*: town in Rhenish Prussia, between the Rhur and the Emscher, 20 m. n.e. of Düsseldorf, in a rich coal and iron district. The town is surrounded by the high chimneys of the steam-engines used in working the mines. As it has risen only very recently to its present importance, its architectural beauties are not great; it has, however, an imposing cathedral, containing many curious reliquaries, crosses, etc. E. owes its prosperity to the inexhaustible coal-mines in its vicinity, to which are due extensive works for all sorts of manufacture in iron. The enormous works of Herr Krupp, discoverer of the method of casting steel in very large masses, who employs about 20,000 men, are at E. At them are manufactured many articles for peaceful purposes, but the gigantic steel guns which the Germans used with such terrible effect at the siege of Paris (1870-1) have made the name of Krupp world-renowned. The annual production is about 330,000 tons of steel, and 26,000 tons of iron. Around the

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works of this great manufacturer quite a city has been formed. Largely through his liberality, excellent houses have been erected for the workmen, and are rented for a very moderate price. Churches have been built; schools of various kinds, including a work-school for women and an industrial school for girls, have been established; a public library is maintained; and places of amusement are provided. Aged employes are pensioned, free medical attendance is supplied for the sick, and hospitals have been erected for treatment of the injured. Fire and life insurances are provided at low rates, and the burdens brought by sickness are lightened by associated effort. There is also a system of practical co-operation through which the workmen obtain their food and other supplies at reduced prices. Thus, in various ways, the social life of the people is made pleasant, and their health and material prosperity are promoted. Although the industrial activity of E. is recent, the town itself dates from the foundation of the Benedictine nunnery 873. Pop. (1880) 56,944; (1890) 78,706.

ESSENCE, n. *ĕs'sĕns* [F. *essence*—from L. *essentiā*, the being of anything—from *esse*, to be: It. *essenzia*]: in *philosophy*, that which constitutes the particular nature of a being or substance; that without which a thing cannot be itself; existence; being; in *OE.*, cause of existence: used by modern writers generally as a synonym for *substance* (q.v.); yet these two words being often vaguely used, it is necessary to fix the author's meaning in each case. In *chem.*, etc., the concentrated preparation of any substance; a perfume; the virtues or qualities of a thing separated from its grosser matter; solutions of the essential oils in alcohol; prepared (1) by adding rectified spirit to the odoriferous parts of plants, or to the essential oils, and distilling; or (2) simply by adding the essential oil to the rectified spirit, and agitating till a uniform mixture is obtained. Thus the essence of lemons is merely a solution of the volatile oil of lemons in rectified spirit. ESSENCE D'ORIENT, n. essence of pearls; liquor prepared from a nacreous substance found in the scales of a fish called the bleak. It is used in the manufacture of artificial pearls. ESSENCE DE PETIT GRAIN, product of distillation from small unripe oranges about the size of a cherry; used as a perfume, like *Orange-flower water*. ESSENCED, a. *-ĕnst*, perfumed. ESSENTIAL, a. *-ĕn'shĕl*, indispensably necessary; important in the highest degree; requisite; pure: N. existence; first principle; chief point; that without which the thing named is non-existent. ESSENTIALLY, ad. *-shĕl-tĕ*. ESSENTIALNESS, n. state or quality of being essential. ESSENTIALITY, n. *-shĕ-ĭl'ĭ-tĕ*, state or quality of being essential; essential nature or character. ESSENTIAL OILS: see OILS.

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ESSENES, n. plu. *ēs-sēnz'*: a sect among the anc. Jews, remarkable for their strict and abstemious life. ESSENISM, n. *ēs'ē-nīzm*, the doctrines or the practices of the Essenes. This small religious fraternity among the Jews, are involved in obscurity as to their name and origin, as well as character and history. Still, in the wide field of the history of Semitic religions, few subjects have greater importance or interest. The Essenes bore one of the most momentous parts in the development of Judaism. Christianity stands in so close connection with them, that John the Baptist and Christ himself have been pronounced by some to have originally issued from their ranks. More surprising than all, out of Essenism, in the stage of Sabæism, has sprung Islam itself, and in this last development of its tenets and practices are still preserved some of its principal rites. It is but natural that from the days of the Fathers to our own, numberless writers, more or less qualified, should have endeavored to throw light on this mysterious brotherhood, but with results far from satisfactory, because of the obvious limitation of the sources which were consulted. Josephus, Philo, Pliny, Solinus, Eusebius, and the Fathers, generally, were considered the only sources, from which the genuine history of this fraternity could be deduced. Of these, Pliny indeed has a geographical notice, which cannot be traced to either Philo or Josephus; but the rest have so evidently derived their shallow and contradictory accounts indirectly, and through corrupted channels, from those two writers, that they lose all claim to consideration. Of the two books of Philo in which information regarding the Essenes is contained, one (*De Vitâ Contemplatîva*) is proved to have been written about three centuries after Philo's death by a Christian monk as a panegyric on ascetic monachism. The other (*Quod Omnis*) is, to say the least, of doubtful genuineness, and is, moreover, at variance with Josephus. As to Josephus himself, it is now generally allowed that his Essenes stand in much the same relation to the historical Essenes as the ideal inhabitants of the *Germania* of Tacitus stand to the real Germans of his time. Strange that for so many centuries the real sources—the Talmudical writings—should not have been thought of. These, *together* with Josephus and Philo, Pliny, and the Arabians Macrisi and Abulfarag, will perhaps better enable us to form an idea, not only of the real state of this community, but, what is of no less moment, to trace the process by which they gradually arrived at their peculiar mode of life and worship.

Epitomizing facts and conclusions, we have to premise, that exception must be taken to the opening statement of Josephus, that there were three different 'sects' among the Jews: the Pharisees, the Sadducees, and the Essenes—a statement copied and accepted till the present day. The Sadducees were a political party, nothing more or less, and, as a matter of course, held religious views antagonistic to, or rather they did not accept the traditions of, their adversaries, the Pharisees, who, again, forming as they did, the bulk of the nation, cannot rightly be called a *sect*.

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Neither can the Essenes be called properly a sect; they were rather an inner circle or association within the wide national company of Pharisees. They were Pharisees of stronger convictions, and carried out the Pharisaic views with a consistency which made them ridiculous even in the eyes of their own mother-party (Sota, 26, a.); neither were they known by the names of Essenes, this being a very late designation, derived either from a Chaldee word *Sacha*, and meaning Bathers, or Baptists; or from *Asa*, meaning Healers. The Mishna, Beraitha, and Talmud speak of these advanced Pharisees in general as Chasidim (*Assidaioi*, Pious Men), Nazirim (Abstinent), Toble Shachârith (Hemero-baptists), Banai (Builders), and Chaberim (Friends). The Arabic book of *Maccabees* calls the Essenes simply *Assidaioi*, and Macrisi speaks of 'Nazirs, Essenes, and Baptists' as all being 'Asaniun,' or Essenes.

The Nazirhood, a kind of voluntary priesthood, enjoining abstinence from wine, flesh, and other sensual enjoyments, had in the troublous times of anti-Syrian agitation, and the general upheaving of society, found numerous adherents (*Tosifta Nazir*, c. 4; *Talm. Babli Berach.* 48, a 1; *Macc.* ii. 49; *Jos. Antiq.* xviii. 1); and gradually there sprang up contrary to the biblical example, which restricts this asceticism to a certain period) a host of men calling themselves 'Nazirs for ever'—Nazire olam (*Nazir*, 4, a.). Pharisees of a spiritual and contemplative bias, with no natural taste for the conflicts and activity of political or public life, or wearied, perhaps with the vanity of human aims, took this vow of Nazirship for life, and constituted themselves into a sort of religious club. Levitical purity in its strictest and highest sense made them draw closer and closer the innumerable '*feuces*' which the traditional law had erected round the biblical law. Any one, friend or foe, could at any moment, by having touched something impure, disturb this purity for the time, and necessitate new and endless purifications. Thus it became necessary, or at least expedient, that those among them who could break all ties of friendship and family, should retire into a solitude not easily approachable by a stranger to their community. Food could not be prepared save by those of the brethren who knew and strictly obeyed the hyper-traditional injunctions. Their dress, every implement of daily use, had to be made under similarly stringent laws of purity. A natural consequence of this their exalted notion of outward priesthood, was—the different phases of woman's life taken into consideration—their general celibacy. (The explanation given by Josephus—The fear of the corruption of both towns and women—is entirely gratuitous, and utterly in discordance with the Jewish notions of the time.) In this state of voluntary isolation, trading was out of the question; they tilled the ground and lived on the fruits of the earth. Taking their meals, and these of the coarsest and plainest description, in common, they idealized the table into an altar, and, prayer having been said, they remained standing silently round it during the repast. That they had no individual property, follows of course,

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and their communistic motto, which the Mishna (Aboth) has preserved to us—'Mine is thine, and thine is mine'—explains itself. We need not enlarge further on their small eccentricities—on the white linen garment, the apron (kenaphaim), the scoop or shovel; they, one and all, are signs and symbols of Levitical purity, the scoop reminding us of a certain Mosaic ordinance during the wanderings in the desert, the apron becoming necessary from the frequent ablution of their hands. Every morning, they bathed, like the priests who ministered in the temple, in pure spring water. They abhorred blood as a source of impurity, and for this reason, probably, some of them abstained also from going up to the temple, where sacrifices were daily offered; others are recorded as present at a festival in the temple (Succah, 51, 53). Their offerings were sent alive under the care of messengers. But these were but outward signs of purity, stepping stones to inner piety, to communion with God, which was to be acquired, according to their notion, only by solitude and an ascetic life. The belief in the efficacy of the most rigid simplicity and willing self-sacrifice, they held in common with the Pharisees; but their horror of oaths, their frequent prayers, their occupation with mystical doctrine, were their own. Untroubled by the noise of war or the strife of parties, leading a life divided between the bath, ablutions, contemplation, and prayer; despising the body and bodily wants; what more natural than that by degrees they should be led into a kind of mystical enthusiasm and fanaticism. They allegorized, they symbolized; and their efforts culminated in seeing the unseen. Absorbed in the attempt to fathom the mysteries of the nature of God one of their principal occupations was the study of the name of God; of that unpronounceable name which only the High-priest dared utter once a year in the Holy of Holies during the most awful and solemn service on the Day of Atonement. The knowledge of that name in four, in twelve, and in twenty-four letters, would give them the power of prophecy and of 'receiving the Holy Ghost.'

Angelology, derived from the Magi, formed a prominent feature of their creed. In the course of time, they were viewed by the vulgar as saints and workers of miracles. A wonderful book of cures (*Sepher Refuoth*), which Talmudic, Arabic, and Byzantine authorities ascribe to Solomon, was in their hands, and with this, 'by the aid of certain roots and stones,' by the imposition of hands, and certain whisperings—a practice strongly condemned by the Pharisees (Synhedr. 90, a.)—they cast out demons and healed the sick. Philosophy they regarded so far only as it treated of the existence of God. Jehovah is the original light; from him proceed a number of spirits (the Platonic Ideas), and at their head stands the Wisdom, or *Logos*, into which, after death, the soul is again absorbed. Their code of Ethics was threefold—the love of God, of virtue, and of man; their scale of perfectibility reaching its acme in the communion with the Holy Ghost (*Ruach Hakodesh*), (Mishn. Sota, 99). In fine, mixing up, in the strangest manner, the most exalted and the most puerile notions, they became

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the forerunners of the Christian Gnostics and of the Jewish Cabbalists, and, it may be, of many secret, still existing orders, who may have derived from this source their ceremonies and the gradations of initiation.

They seem never to have numbered more than 4,000, including even those Nazirs or Essenes who remained in their own families. Their colony appears to have been established chiefly near the Dead Sea, and it is undoubtedly this colony which has served Josephus as a basis to his romantic Essene republic. But, however distant from each other they might be, a constant intercommunication was kept up through a body of delegates, or angels (Malachim). As they had sprung from the Pharisees, so they merged again into them—part of them, we should rather say; the remaining part became Therapeutæ, or Christians: see THERAPEUTÆ: JEWISH SECTS. The Talmud gives a distinct account of their ceasing to exist as a separate community (Bechorot, 27), and so soon after their extinction did they fall into oblivion, that in the third c. we find a Jewish sage asking who *these Hemerobaptists* had been (Berachot, 22, 1).

Much has been written and said of a certain literature which they possessed; on this we are without any trustworthy authority. One fragment only remains; it is quoted in the Talmud (Jerusch. Berachoth. End) in the following words: 'It is written in the book of the *Chasidim*, If thou leavest it (the divine law) for one day, it will leave thee for two.'

In addition to the Talmud and Midrash, see Joseph *Antiq.* xv. 10, xviii. 1; *Jew. War.* ii. 7, 8; Philo, *Quod Omnis Prob. lib.* § 12; Plinius, *Hist. Nat.* v. 17; Epiphanius, *Heres.* xxix.; Hieron., Cyrill., Chrysost., etc. Beckermann, *Ueber die Ess.* (1821); the histories of the Jews by Iost, Ewald; and Grätz; articles by Franckel; Sprenger's *Leben Mohammedi's* (1861); Leutbecher's *Die Essäer* (1857); the works of Reuss and Keim.

ESSENTIAL, etc.: see under ESSENCE.

ESSEQUIBO, *ěs-sā-kē'bō*: most westerly of the great rivers of British Guiana, rising in the Acarai Mountains, 41 m. n. of the equator, and after a course of 620 m. entering the Atlantic near the Venezuelan frontier, forming an estuary 20 m. wide, in which lie numerous fertile islands. The E. receives numerous large tributaries, as the Cuyuni and Mazaruni; on the Potaro, another affluent, is the magnificent Great Kaietur Fall, more than 700 ft. in sheer descent, discovered 1870. On the banks of the E. are forests of locust-tree, iron-wood, ebony, greenheart, and other fine timber trees, festooned with orchids, and laced together with lianas and other climbing plants. Beyond the forests are vast savannahs, formerly forests destroyed by fire, and now swamps of brushwood, reeds, and coarse grass. The E. is navigable for large ships to the first cataracts, about 60 m. from the sea. The county of E. has not prospered so much as Demerara and Berbice. Many of the old plantations are out of cultivation. Pop. 27,000, exclusive of 2,000 Indians.

ESSERA—ESSEX.

ESSERA, n. *ēs'sēr-a* [F. *esséré*; of Arabic derivation]: in *med.*, species of cutaneous eruption, consisting of small reddish tubercles over the whole body, accompanied by a troublesome itching. It seems to be a kind of lichen or urticaria.

ESSES, **COLLAR OF**: see **SS**, **COLLAR OF**.

ESSEX, *ēs'ēks*: maritime county of the s.e. of England, having the North Sea on the e.: the Thames estuary, dividing it from Kent, on the s.; Middlesex and Hertford on the w.; and Cambridge and Suffolk on the north.; greatest length from n.e. to s.w. 63 m., greatest breadth from e. to w. 54 m. It has 1,055,161 statute acres, nine-tenths being arable or in grass, and a twentieth in wood. The coast-line is 85 m. long. Some cliffs at the Naze are 35 ft. high. The centre and north of the county are beautifully diversified and richly wooded, the highest point being Langdon Hill, 620 ft. above the sea. Besides the Thames, the chief rivers are the Stour, 50 m. long; Blackwater, 46 m.; Lea, Roding, Crouch, and Chelmer. The e. of the county is mostly on London clay, with limestone beds near Harwich. In the middle and north, there is much diluvium, with chalk fragments. Crag occurs near Harwich, and stones of phosphate of lime are found here and there. E. has few manufactures, except in the neighborhood of London, where are chemical works, tar, and other works of a kind that could not be carried on in a large scale within the metropolitan boundaries. The Thames Iron-work and Ship-building Company, near the new Victoria Docks, are another manufacturing feature of the county. At Colchester, is a great silk-mill, also at Bocking, Braintree, and Halstead. Tambour lace is made at Coggeshall and a few other places; there is straw-plaiting in some of the smaller towns, but the county has comparatively few distinctive manufactures. The chief crops are wheat, barley, oats, beans, potatoes, saffron, caraway, and hops. Great numbers of calves are fattened for the London market, and there are large sheep-flocks. E. has valuable oyster fisheries. Pop. (1881) 576 634; (1891) 785,399. The county is almost entirely in the diocese of Rochester. E. returns eight members to parliament. E. was once forest-land, and the seat of a powerful tribe, the Trinobantes, whose famous chiefs, Caractacus and Boadicea, were overthrown by the Romans. E. constituted part of the Roman *Flavia Caesariensis*. It has afforded many Roman remains, and a Roman road once passed through Colchester, which was an important Roman station. The Saxon kingdom of E. included London and parts of Middlesex, Hertford, Bedford, and Essex.

ESSEX, **ROBERT DEVEREUX**, Earl of: 1567, Nov. 10—1601, Feb. 25; b. Netherwood, Herefordshire; son of Walter Devereux, first earl of E. He entered Trinity College, Cambridge, at the age of ten, where he remained for four years. Lord Burleigh, to whose guardianship he had been intrusted, introduced the handsome and gifted youth at court 1584. Here, by his agreeable manners, his appear-

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ance, and talents, he established himself among troops of friends, and gained the special favor of Elizabeth. In 1585, he accompanied the Earl of Leicester to Holland, where he distinguished himself at the battle of Zutphen, and on his return to England was made master of the horse and knight of the Garter. After the death of Leicester, E. continued to rise in the favor of Elizabeth, who loaded him with honors. In 1591, he commanded the forces sent to the assistance of Henry IV. of France against the Spaniards, but achieved no success. The next few years were spent in endeavoring to get the better of Burleigh—the wisest, the most prudent, and the most politic of all Elizabeth's advisers. In 1596 E. was appointed joint-commander with Lord Howard in the expedition against Spain, to which Burleigh was strongly opposed; and though E. displayed all his wonted courage, and contributed to the capture of Cadiz, which caused immense loss to the Spaniards, yet the expedition resulted in nothing, and E. had to defend himself against various accusations on his return. In 1597, he was made earl marshal of England, and, on the death of Lord Burleigh, chancellor of Cambridge. In 1598 occurred the first fatal mistake in E.'s career. Presuming upon Elizabeth's admiration and feminine fondness for his person, he differed from her about some trifling matter, and angrily and rudely turned his back upon her in the presence of some of the council, and her majesty, whose language was hardly more delicate than her father's, gave him a vigorous box on the ear, telling him to 'go and be hanged.' A violent quarrel ensued, which, though apparently smoothed up, was never really so. E. was afterward, 1599, sent to Ireland—part of which at that time was in a state of rebellion—as lord-lieut. of that country; but here his government was ill-advised and ineffectual, and after a few unimportant undertakings, he concluded a truce with the rebels, which was regarded at court as high treason. To confront his enemies, he hastened back to London, contrary to the queen's express commands, and forced his way into Elizabeth's bedchamber. Justly offended, the queen deprived him of his dignities, and commanded that he should be called to account for his behavior. E., advancing from one degree of foolhardihood to another, tried to excite an insurrection in London. He was imprisoned, tried, and found guilty. Elizabeth long delayed signing the warrant for his execution, in the hope that he would implore her pardon. He was beheaded, after defending himself with pride and dignity. E. was rash, bold, and presumptuous; but brave, generous, and affectionate, and the friend and patron of literary men.

ESSEX, *ēs'sēks*. ROBERT DEVEREUX, Earl of: 1591-1646, Sep. 14; b. London: soldier. When 11 years old he was restored by James I. to the rank and titles held by his father, the second earl, and became a companion of the young Prince of Wales; and when 15 years of age was married to Frances Howard, daughter of the Earl of Suffolk and a year his junior, from whom he was divorced

Esquimaux Winter Station, Greenland.



Esparto Grasses.—1, *Stipa tenacissima*; 2, Fruit of ditto; 3, *Lygeum Spar*
Vol. 11. tum; 4, Flowering stem and (5) fruit of ditto.

ESSEX—ESTABLISH.

1613. He served in the army of the elector palatine in Holland 1620-23, was vice-admiral of an unsuccessful naval expedition against Cadiz 1625, and was lieutenant-general of an army sent by King Charles against the Scotch Covenanters 1639. Espousing the cause of the parliament against the king, he was appointed to the command of the parliamentary army at the beginning of the civil war, was victorious over Charles at Edgehill 1642, captured Reading 1643, and relieved Gloucester, but lost the greater part of his army 1644. He urged the impeachment of Cromwell before the house of lords, 1645, when Cromwell forced the adoption of the 'self-denying ordinance,' and E. had to resign his commission. An annuity of £10,000 was settled on him for life.

ESSEX, THOMAS CROMWELL, Earl of: see CROMWELL, THOMAS.

ESSEX EMERALD, n.: a geometer moth, *Geometra smaragdaria*.

ES-SIOUT: see SIOUT.

ESSLINGEN, *ēs'ling-ĕn*: manufacturing town of Germany, kingdom of Württemberg; near the right bank of the Neckar, in the centre of a pleasing and fertile district, seven m. e.s.e. of Stuttgart. It consists of the town proper, and five suburbs, and is surrounded by strong walls, and fortified by towers. The chief buildings are the *Frauenkirche*—a splendid edifice in the purest Gothic style, built 1440, surmounted by a spire 230 ft. high—the old and new town-house, and the old castle. It has the greatest machine-making trade of the kingdom, has manufactures of a wine called, E. champagne, of woollens, and cotton and woollen yarns, lacquered iron, silver-plate and tin wares, and paper, with good trade in wine and agricultural produce.—E. was founded in the 8th c., and received 1209 the rights of a free city of the German empire. The long and bloody quarrel between it and the House of Württemberg ended at the peace of Lunéville (1802), when E., with its territory, was assigned to the duchy of Württemberg. —Pop. (1880) 20,758. (1890) 22,156.

ESSOIN, or ESSOIGN, n. *ēs-soyn'* [OF. *essoîn*—from mid. L. *exōnīſm*, business, occupation, an excuse for non-fulfilment of duty]: in *OE.*, a lawful excuse for an absent person, or for the absence of a person summoned to appear in court; a good cause of discharge for an impotent person.

ESSONITE, n. *ēs'son-īt* [Gr. *hēssōn*, lower, less, because less hard than zircon, idocrase, etc., which it resembles]: in *mineral.*, cinnamon stone; cinnamon colored or yellow variety of grossularite or wilnite, which is a variety of garnet. E. is from Ceylon.

ESSORANT, a. *ēs'so-rant* [F. *essor*, the soaring of birds]: in *her.*, term applied to a bird represented with its wings half open as though preparing to take flight.

ESSOUAN', or ESWAN': see ASSOUAN.

ESTABLISH, v. *ēs tāb'lish* [E. *établir*, to establish: F. *établissant*; OF. *establissant*, establishing: OF. *establiſr*—

ESTABLISHED CHURCH.

from *L. stabilis*, that stands fast, firm]: to settle or fix firmly; to found permanently; to make firm; to constitute; to decree; to ratify. ESTAB'LISHING, imp. ESTAB'LISHED, pp. *lisht*: ADJ. settled firmly, as by law. ESTAB'LISHER, n. one who. ESTAB'LISHMENT, n. the act of establishing; a household; settlement; income; a place of trade; that which is fixed or set up permanently; a form of religion supported by, and in connection with, the state. ESTAB'LISHMENT OF THE PORT, a term employed to denote the interval between the time of high water at any given port, and the time of the moon's transit immediately preceding the time of high water, when the moon is at the new or full moon.—SYN. of 'establish': to confirm; fix; settle; institute; found; erect; set up; enact; ordain; uphold.

ESTABLISHED CHURCH: church established and maintained by a state for the teaching of Christianity in a particular form within its boundaries. Subsequent to the Reformation, many of the opinions which had given sanctity to the Church of Rome still kept possession of men's minds; among these was the notion, that the civil government of each state was bound to maintain a particular form of Christianity. The same fallacious reasoning which in more recent times has led to the search for one absolutely best form of civil government was at work then with reference to the church. The Rom. Cath. Church was not the best form—of that the Prot. states had become convinced—but all forms were not therefore indifferent; and if one was better than another, and another better than that, there must be an absolutely best, which the state was bound to discover, and when discovered, to substitute for that which had been abolished. The idea that the good or bad qualities of forms of government, whether civil or ecclesiastical, so long as they did not violate the fundamental doctrines of Christianity or morality, were relative, and not absolute, and that whilst one might be the best for men in one stage of development or of one particular temperament, another form might be the best for others, did not belong to that age. Each Prot. state consequently established a church, conformity to the tenets of which it enforced, not only upon those who as ministers were henceforth to enjoy the property which in Rom. Cath. times had been devoted to the spiritual interests of the community, but very often on its own civil servants and advisers. The benefit of the arrangement was, that, to a greater or less extent, the means which the community had set apart for its own spiritual improvement were protected from the spoliation of private individuals; and this benefit was secured more effectually the more completely the new church took the place of the old—in England, for example, better than in Scotland; but as each of the Prot. states had substituted one form of church-govt. for another, and as the same form had not been adopted by them all, the idea of there being one form which was absolutely preferable to the others, though not abolished, was rudely shaken. In England, Queen Elizabeth had stated in her celebrated declaration, that she, as head of the church, 'would not endure any varying or departing in the

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(least degree' from the doctrines of the Episcopal Church of England as set forth in the Thirty-nine Articles; and yet Presbyterianism was established in England 1649. In Scotland, where Presbyterianism had at first taken root, Episcopalianism had more than once become the law of the land. The effect of such occurrences was to counteract the belief in any one form as the form for all Christendom, and to facilitate dissent and the formation of sects. The pastors of these sects were not at first recognized by the law as entitled to any of the privileges of Christian ministers. Whatever they might be to their own flock, to the state they were laymen, and their churches were mere secular lecture-rooms, or, at most, places of meeting for private devotion: see NONCONFORMISTS: DISSENTERS: CHURCH: ETC. Gradually this view became modified, and the civil consequences attaching to sacred rites, when performed by a clergyman of the establishment, were extended to them when performed by dissenters: see MARRIAGE. But though many of the privileges, and all the liberties belonging to the established church, have now been extended to dissenting bodies, including Rom. Catholics (see ROMAN CATHOLIC EMANCIPATION) and Jews (see JEW), the established churches of England and Scotland are supported by the state, and guarded from spoliation by the coronation oath (q.v.). The grant to the Rom. Cath. college of Maynooth, and the *Regium Donum* (q.v.) to the Presb. ministers in Ireland, were capitalized by the act (1869) which disestablished the Irish Church. There is no endowment to other religious denominations, as in France; and the emoluments of the established church in England, though modified in their distribution by the labors of the Ecclesiastical Commissioners (q.v.), have not yet been appropriated to any other religious uses than these in connection with that church.

The cause of established churches is very generally maintained on the ground of the alleged duty of the state to provide for the religious instruction of the whole body of the people, as most essential to their moral welfare and so to the general prosperity of the community. It is further argued, in support of the same cause, that civil rulers, or the people as associated in a free state, are under a moral obligation of the highest kind, to acknowledge God, his law, and his ordinances. Concerning these and other arguments, for and against established churches, see the article VOLUNTARIYISM. It may here, however, be observed, that the arguments just mentioned do not necessarily infer, even when admitted to the utmost, that the state is bound to support in any exclusive way a particular sect or denomination, unless, on the further assumption that religious truth and worth belong to that denomination alone. Nor does the *endowment* of a church by the state necessarily follow from the fullest adoption of the principles thus contended for. Yet, on the other hand, it is a point which may very reasonably be disputed, how far the common arguments against state endowments are applicable to those endowments not originally bestowed by the state, but which the state has, from a very early period, recognized as be-

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longing to the church; a description which will be found to comprehend great part of the existing endowments to established churches. The exclusive possession of them by a particular denomination, and their rightful mode and sphere of appropriation to religious uses, are, however, distinct questions.

ESTACADE, n. *ès-tu-kād* [F.]: in *fort.*, a line of stakes in water or swampy ground to check the approach of an enemy.

ESTAFET, or ESTAFETTE, n. *ès-tū-fèt* [F. *estafette*—from *stafetta*]: in *Europe*, one of a series of couriers in relay; an express for conveyance of letters and small packages.

ESTAING, *ès-tāng*, CHARLES HECTOR, Comte D': 1729-1794, Apr. 28; b. Auvergne, France: army and navy officer. He entered the French army as col. of inf.; was promoted brig.gen. 1757; accompanied the expedition of Comte de Lally to the E. Indies; and was captured at the siege of Madras, 1759. He was released on parole, and without awaiting exchange, took command of several men-of-war and greatly harassed the English in various parts of the East. On his return to France, 1760, he accidentally fell into the hands of the English, and, being charged with breaking his parole, was imprisoned sometime in Portsmouth. In 1763 he was appointed lieut.gen., and 1777 vice-admiral in the French navy. In 1778, in accordance with the treaty between France and the United States, France fitted out a fleet of 12 ships of the line and 4 frigates to aid the latter in the struggle against Great Britain, and E. was placed in command. He sailed Apr. 13, reached Del. bay in July, and then proceeded to New York, expecting to encounter the British fleet on the way. He captured some prizes off the coast of N. J.; agreed to assist in a land and sea attack upon Newport to expel the British from R. I.; reached the harbor late in July; and hearing of the approach of a fleet put to sea to meet it. He was overtaken by a severe storm which caused him to put into Boston for repairs, and the projected attack failed. Subsequently he captured St. Vincent and Grenada, W. Indies; and 1779, Oct. 9, coöperated with Gen. Lincoln in an ineffectual attempt to capture Savannah, Ga. He returned to France 1780; commanded the allied fleets of France and Spain 1783; was elected to the assembly of nobles 1787; appointed to the command of the national guard 1789; chosen admiral of the navy 1792; testified in favor of Marie Antoinette at her trial 1793; and despite his eminent military and naval services to France was condemned as a royalist and guillotined.

ESTANCIA, n. *ès-tān'si-ā* [Sp. a mansion]: in *S. Amer.*, an estate; a farm.

ESTATE, n. *ès-tāt* [F. *état*; OF. *estat*—from L. *status*, state, position]: condition of a person or thing; rank; landed property; property in general; orders or classes of men in a country; dominions or possessions: V. in *OE.*, to settle, as a fortune. ESTATES, n. plu. *ès-tāts'*, in *Scrip.*, persons of high rank; in *Scot. hist.*, the house of parlia-

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ment. ESTATE-REAL, lands and tenements. -PERSONAL, movable property. TAIL: see ENTAIL.—THREE ESTATES OF THE REALM, in *Britain*, the three branches of the legislature, the lords spiritual, the lords temporal, and the commons of Britain and Ireland (not, as popularly believed, the sovereign, lords, and commons): see STATES. FOURTH ESTATE, a name popularly and familiarly applied to the newspaper-press; journalists.

ESTATE, in Law: in its widest sense, property, both real and personal; but technically, the measure of a person's right to, or interest in, real property. The division of property into feal and personal grew out of the nature of the remedies necessary to reinstate an owner who had been deprived of either, and may be traced to ideas borrowed from the Feudal law. Land itself is always viewed as real estate; but other things are classed among real or personal property, according to the intent with which they have been annexed to land and to a certain extent according to the manner in which the annexation has been made. Sometimes, however, by force of an equitable doctrine under which whatever is agreed to be done is regarded as done, things in no way physically attached to land may for the purpose of doing justice be regarded as land. A familiar instance of the application of this principle is the case of money directed by will or agreement to be laid out in land. Such money is considered land. And conversely, if land is directed to be converted into money, all the attributes of personal property may attach to such land. Estates may in the first instance be divided into legal and equitable. By the former is meant the estate which a person has at common law, by the latter an interest created by or enforceable in a court of equity: see EQUITABLE ESTATES: USES: TRUST. Legal estates may be considered with reference to the quantity of the estate, the time of enjoyment, and the number of persons who may unite in the enjoyment. Under the first division, estates are either freehold or less than freehold. Freehold estates, again are divided into freeholds of inheritance or fees (q.v.), and freeholds not of inheritance, or for life. An estate for life may be for the life of the person to whom it is granted, or for that of another person, or for more than one life. A person holding an estate for the life of another is called tenant *per antre vie*. An estate *per antre vie*, being a freehold, descends in case of the death of the tenant during the term to his heir, and not to his executor. See COURTESY, in Law: DOWER. Estates less than freehold are also called chattels real, and on the death of the tenant pass to his executor. They are divided into estates for years, estates at will, and estates on sufferance. See LEASE. With reference to the time of their enjoyment, estates may be divided into estates in possession or in expectancy. An estate in possession comprehends not only an estate in the actual occupation of the tenant but one from which he may have been wrongfully ousted. An estate in expectancy may be either in reversion or remainder: see REVERSION: REMAINDER. With reference to the number of persons entitled to the enjoyment, estates may be in severalty, in joint

tenancy, in coparcenary or in common. An estate in severalty, is where the sole right to the estate is in a single person. See JOINT TENANCY: COPARCENARY: TENANCY IN COMMON: also ESTOVER: EMBLEMENTS: WASTE; CHATTEL: RIGHT OF ENTRY.

ESTÉ (ancient *Ateste*): town in the Italian province of Padua, on the s. slope of the Euganean Hills, 17 m. s.s.w. of Padua. It is an old town, and has a decidedly Lombard appearance, many of the houses being supported by arches. It has several interesting buildings, among which the chief are the *Rocca*, or castle of E., with a grim donjon tower, overhanging the town, and the church of *San Martino*, in Romanesque style, surmounted by a campanile, which slopes as much as the Leaning Tower of Pisa. Both church and tower have been sadly disfigured by an attempt to modernize them. E. manufactures silk goods, saltpetre, hats, and earthenware and has numerous silk-mills and whetstone quarries in the vicinity. Pop. about 6,000.

ESTÉ: one of the oldest and most illustrious families of Italy, which, according to the historian Muratori, owed its origin to those petty princes who governed Tuscany in the time of the Carlovingians, and who were in all probability of the race of the Longobards.—The first whose figure is more than a mere shadow is Adalbert (died about A.D. 917).—The grandson or grandnephew of Adalbert, named Oberto, was one of the Italian nobles who offered the crown of Italy to Otho of Saxony. He is afterward styled *Comes sacri palatii*, and appears to have been one of the greatest personages in the realm; he married a daughter of Otho, and died about 972.—In later times, the family of E. received from the emperors several districts and counties, to be held as fiefs of the empire. The family divided, at an early period, into two branches, the German and Italian. The former was founded by Welf or Guelfo IV., who received the investiture of the duchy of Bavaria from Emperor Henry IV. 1070. The houses of Brunswick and Hanover, and consequently the sovereigns of Great Britain, called also Este-Guelfs, are descended from this person. In the 12th, 13th, and 14th c., the history of the E. family, as heads of the Guelf party, is interwoven with the destinies of the other ruling families and small republics of n. Italy. During this period they gained possession first of Ferrara and the march of Ancona (1208), afterward of Modena and Reggio (1288–9), and were widely celebrated as the patrons of art and literature.—One of the most illustrious was Azzo VII., who encouraged Provençal troubadours to settle at his court at Ferrara, and founded schools in that city.—Alfonso I. (died 1534) was distinguished equally as soldier and statesman, and was celebrated by all the poets of his time, particularly by Ariosto. His second wife was the notorious Lucrezia Borgia. His quarrel with the Popes Julius II., Leo X., and Clement VII., was unfortunate, as an interdict was laid upon him for his adherence to the league of Cambray, and his papal fiefs declared forfeited. After the siege of Rome, 1527, the duke was restored to his former possessions by Charles V.—His suc-

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cessor, Ercole or Hercules II., who married Renate, daughter of Louis XII. of France and Anne of Brittany, attached himself to Charles V. He and his brother, a dignitary of the Rom. Cath. Church, were also liberal patrons of art and science; the latter erected the magnificent Villa d'Este at Tivoli.—The next prince, Alfonso II. (died 1597), would have been not inferior to the preceding but for his immoderate love of splendor, his inordinate ambition, and his cruelty toward the poet Tasso, whose eccentricities, however, it must be confessed, were enough to try the patience of any man.—Alfonso IV. (latter half of the 17th c.) was very fond of the fine arts, and founded the Este gallery of paintings.—RINALDO (died 1737), by his marriage with the daughter of the Duke of Brunswick-Lunenbourg, united the German and Italian houses, separated since 1070.—The male line of the house of E. became extinct on the death of Ercole III. 1803, his possessions having been previously seized by the French invaders, and annexed to the Cisalpine Republic. His only daughter married the Archduke Ferdinand, third son of Francis, emperor of Austria.—Their eldest son, Francis IV., by the treaty of 1814–15, was restored to the territories which had belonged to his maternal ancestors, comprising the duchy of Modena; and, on his mother's death, obtained the duchies of Massa and Carrara.—He was succeeded by his son, Francis V., 1846, Jan. 21.—The connection which the family of E., like others of the small Italian principalities, had formed with Austria, gave it pro-Austrian sympathies, the result of which has been fatal to its popularity and dynastic existence. In 1860, the sentiment of Italian unity and independence, which for the previous 15 or 20 years had been steadily fostered by the policy of Sardinia, triumphed in a universal explosion of national feeling, which united the peninsula (with the exception of Rome and Venice) under the authority of Victor Emmanuel. Venice was added to the kingdom of Italy 1866, and Rome became the capital 1870.

ESTEEM, *v.* *ēs-tēm'* [F. *estimer*, to esteem—from L. *æstimō*, I set a price upon: It. *estimare*]: to set a high value upon; to prize; to regard with respect or friendship; to think; to hold in repute: N. a high value set upon; respectful or reverential regard; in *ŌE.*, estimate; reckoning. **ESTEEM'ING**, *imp.* **ESTEEMED'**, *pp.* *·tēmd'*. **ESTEEM'ABLE**, *a.* *·ā-bl*, that can or may be esteemed. **ESTEEM'ER**, *n.* one who. **ESTIMABLE**, *a.* *ēs-tī-mā-bl* [F.—L.]: that can be estimated or valued; worthy of esteem or honor; deserving regard; valuable. **ESTIMABLY**, *ad.* *·blly*. **ESTIMABLENESS**, *n.* *·bl-nēs*. — **SYN.** of 'esteem, *v.*': to value; respect; revere; reverence; regard; estimate; appreciate; reckon.

ESTELLA, *ēs-těl'yā*: ancient city of Spain, province of Navarre, pleasantly situated on the left bank of the Ega, about 27 m. s.w. of Pamplona. It is a well-built, clean town, with several squares, and has, in the environs, a variety of agreeable promenades and pleasure-grounds. It has two interesting churches, both old, and one of them,

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San Juan, a fine building with a very lofty tower. The manufactures are woolen and linen fabrics, brandy, and earthenware. A moderately good wine is made in the vicinity. E. has some trade in fruits, wool, hardware, and grain. Here Don Carlos was proclaimed king 1833, Nov.; and at E., again become a Carlist stronghold, battles were fought 1874 and 5. The city was taken by the govt. troops 1876, Feb.—Pop. abt. 7,000.

ESTEPA, *ès-tā'pá*: town of Spain, province of Seville, 60 m. e.s.e. of the town of Seville. It is, on the whole, well built; has four squares, and numerous religious edifices, among which are the churches of Santa Maria and San Sebastian; the former, a noble specimen of Gothic, having three naves, and a richly ornamented interior. E. has manufactures of coarse cloth, baize, and oil, with trade in grain, fruits, oil, brandy, wool, and cattle. In the vicinity are marble and building-stone quarries. Pop. 8,339.

ESTEPONA, *ès-tā-pō'ná*: maritime town of Spain, province of Malaga, 25 m. n.n.e. of Gibraltar. It is well and regularly built, with streets wide, clean, and well paved. It supplies Gibraltar with fruits and vegetables; and its chief industrial features are its fishing, linen-weaving, and manufactures of leather. Pop. 9,900.

ESTERHAZY, *ès-tér-há'zē*: ancient Hungarian family, afterward raised to the rank of princes of the empire, the representative of which is at present the richest landed proprietor in Austria. The family divided into three main branches—the Esesznek, Altsohl or Zolyom, and Forchtenstein lines.—A descendant of the last family, NICHOLAS D'E. (b. 1765), travelled over a great part of Europe, and resided for a considerable time in England, France, and Italy. He founded the splendid collection of pictures at Vienna. He also made a choice collection of drawings and engravings. When Napoleon, 1809, entertained the notion of weakening Austria by the separation of Hungary, he made overtures to Prince E. respecting the crown of Hungary, which, however, were declined. The great Haydn composed most of his works at the court of Prince Nicholas.—His son, Prince PAUL ANTON D'E. (1786-1866), entered at an early age on a diplomatic career. After the peace of Vienna, he went as ambassador to the court of Westphalia. From 1815 to 18, he represented the Austrian govt. at London. He filled the same office 1830-38, and distinguished himself by diplomatic tact and ability. In 1842, he returned home, and continued to exert himself in the cause of political and literary progress. In 1848, Mar., he became minister of foreign affairs, in the cabinet presided over by Batthyani; but when the struggle between Austria and Hungary broke out, he exhibited more prudence than heroism by retiring from public affairs altogether. The hereditary prince, NICHOLAS PAUL CHARLES E. (b. 1817, June 25), married Lady Sarah Villiers, daughter of the Earl of Jersey.

ESTHER, *ès'tér* (signifying 'the planet Venus'): is the Persian name of Hadassah, daughter of Abihail, the son of

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Shimei, the son of Kish, a Benjamite. She is represented in Scripture as an orphan, and as having been brought up by her cousin Mordécail, officer in the household of the Persian monarch Ahasuerus. Her history, in the Book of Esther, is extremely interesting. When the misconduct of Vashti had cost her her 'royal estate,' all 'the fair young virgins' of the kingdom were gathered together, that Ahasuerus might choose a successor. He selected Hadassah, who received the name E for her loveliness. The great event of her life was the saving of her Jewish countrymen from the horrors of that universal massacre planned by the malice of Haman, and consented to by the thoughtless cruelty of an oriental despot. E.'s success was signal; and the feast which she and her cousin Mordecail appointed in memory of their deliverance—viz., the feast of Purim (i.e., of Lots), is, in consequence, celebrated to this day with great enthusiasm. E. is not mentioned in profane history, whence it has been inferred by some that she was not exactly the *wife* of Ahasuerus (Xerxes), but rather the favorite of his harem, to which she undoubtedly belonged; for, as we read (ii. 8), E. was consigned 'to the custody of Hegai, keeper of the women. This hypothesis perhaps gains probability from the fact, that the Persian kings did not choose wives from their harem, but from the principal Persian families, or from the daughters of foreign potentates.

ESTHER, Book of: one of the very latest of the canonical books of the Old Testament, and commonly, but without a shadow of evidence, supposed to be written by Mordecail or Ezra. This is the view of Abenesra, Cleinent of Alexandria, Augustine, Gerhard, and others. The Talmud assigns the authorship to the members of the Great Synagogue, a semi-mythical body, used by Jewish rabbis and Christians divines as a sort of *Deus ex machina* to solve every difficulty. According to the opinions of the most learned and unprejudiced critics the date of its composition must be placed after the downfall of the Persian monarchy. The language is much later than that of Ezra, and Nehemiah, and the fact of occasional explanation of Persian customs fits the period of the Seleucidæ better than an earlier one. The Hebrew text is that which has been followed in the English version; but the Septuagint is full of late interpolations and additions by Alexandrian Jews. The book is held in the highest reverence by the Jews; so much so, that Maimonides declared that, in the days of the Messiah, every Jewish scripture would be forgotten except the book of Esther and the Pentateuch. The book is not written in a theocratic spirit, like the rest of Jewish literature. Nothing is directly attributed to God; in fact, his name is not mentioned. Neither is there the remotest trace of religious feeling of any kind. Luther, in his usual off-hand way, expressed his contempt for the book, in spite of the admiration which the Jews bestowed on it, censuring it for its 'heathenish extravagance,' and declaring that, in his judgment, it was 'more worthy than all of being excluded from the canon.' The absence of all recognition of God, perplexed some of the ancient Jewish

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commentators, who therefore invented the hypothesis, that the book was originally a part of the Persian chronicles, probably executed by Mordecai. The hypothesis that it is a Persian chronicle, is by many late Christian scholars accepted as solving many difficulties. On this theory, this book has its place in the Bible by divinely inspired direction, as had the decrees of Nebuchadnezzar, Cyrus, and Darius. It is inserted as showing God's interposition by His providence to save the race of Israel from extinction, so that from it might come, according to the flesh, the promised Christ.

The *Apocryphal additions* to E. consist of six important passages, found neither in the Hebrew nor in the Chaldee, translated by Jerome into Latin, and printed in later editions of the Vulgate without his explanations. In the later form they are found in the English version of the Apocrypha.

ESTHERIA, n. *ēs-thēr'-ā* [an anagram for *Theresia*]: genus of crustaceans, order *Phyllopoda*, family *Limnadiadae*. The body is protected by a bivalve carapace, with concentric lines of growth, the two bivalves of which are united at their beaks, though they have not a ligament. Twenty-four recent species have been discovered, all inhabitants of fresh or of brackish water, not one marine. Till 1856, the carapace of Estheria found in the Old Red Sandstone of Scotland was believed to be the bivalve shell of a small marine mollusk *Posidonomya minuta*. The discovery in that year by T. Rupert Jones that it was probably crustaceous and from fresh or brackish water was one reason for abandonment of the old view that the Old Red Sandstone of Scotland was marine. Estheria has been found in England, Scotland, and Ireland, in France, Germany, Russia, N. America, and Central India.

ESTHESIOMETER, n. *ēs-thē-sī-ōm'ē-tēr* [Gr. *aisthēsis*, perception, sensibility; *metron*, a measure]: in *surg.*, an instrument to ascertain the tactile sensibility of the human body. It has two points, adjustable as to distance, and the object is to ascertain the greatest proximity at which the points give distinct sensations. The result is indicative of normal or abnormal condition of the surface.

ESTHETICS: see *ÆSTHETICS*.

ESTHONIA, *ēs-thō'nī-ā*, called by the inhabitants *Wiroma* (i.e., the Border-land): Russian government, one of the Baltic Provinces (q.v.). It extends immediately s. of the Gulf of Finland; 7,787 sq. m. It was conquered (1182-1241) by the Danes, who sold it to the Teutonic knights 1346. It came into the possession of the Swedes 1561, but was taken from them by Peter the Great 1710; and by the treaty of Nystadt was finally secured to Russia 1721. One-third of the entire surface, which is in general flat, is under cultivation, and produces great quantities of rye and barley; the remaining two-thirds are chiefly sandy tracts and marshes, strewn in many places with large blocks of granite; there are also extensive forests of birch and

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pine. The govt. of E. is divided into four circles; its principal town is Reval or Revel (q.v.).

The inhabitants are divided into Esthlanders and Esths. The former are a mixture of Swedes, Germans, and Russians, and comprise the nobles and the town-populations. The latter belong to the Finnish race, and are the original possessors of the soil. Their language is soft and musical, and is divided into two leading dialects, that of Revel and that of Dorpat. They possess a literature rich in splendid national songs. See Neus, *Esthnische Volkslieder* (Reval, 1850-1). They are industrious, kind-hearted, and in the main religious and attached to the Prot. doctrines. A great part of Livonia is peopled with Esths, the entire number of whom in all the Baltic provinces is about 650,000.—Pop. of E. (1880) 353,108 ; (1889) 392,738.

ESTHS, n. plu. *ěsts*, or ESTHONIANS, n. plu. *ěs-thō'ni-ănz*: a people s. of the Gulf of Finland, allied to the Finns: see ESTHONIA.

ESTIENNE, or ETIENNE: see STEPHENS (family of printers).

ESTIMATE, v. *ěs-ti-măt* [L. *æstimātus*, valued, rated (see ESTEEM)]: to form an opinion of the value of or expense of; to fix the value by comparison and from experience; to calculate: N. the computed cost of anything; a valuing or rating by the mind; a valuation. ES'TIMATING, imp. ES'TIMATED, pp. ES'TIMATOR, n. -*tér*, one who. ES'TIMA'TION, n. -*mă'shŭn* [F.—L.]: an opinion or judgment of the value or worth of; esteem; regard; favorable opinion. ES'TIMATIVE, a. -*mă-tiv*, able to estimate or judge.—SYN. of 'estimate, v.': to appraise; value; appreciate; prize; rate; number; count; esteem; judge; compute; regard; honor.

ESTIVATION, ESTIVAL: see ÆSTIVATION.

ESTOC, *ās-tok'* [Italian]: small dagger worn at the girdle, called in Elizabethan times a tucke.

ESTOILE, *ās-toyl'*, or STAR, in Heraldry: charge, differing from the mullet (q.v.) by having six waved points; the mullet consisting of five plain points: see MULLET.

ESTO PERPETUUM, *ěs'tō pēr-pět'ū-ŭm*, or ESTO PERPET'UA, -*pět'ū-a* [L.]: may or let it be perpetual or forever.

ESTOPPEL, n. *ěs-tōp'ěl* [OF. *estouper*, to stop]: in law, impediment, or bar to a right of action, arising from a man's own act. It is called an estoppel or conclusion, because a man's own act or acceptance stoppeth or closeth up his mouth to allege or plead the truth.—*Co. Litt.* 352 a. Estoppels are of three kinds—1. By matter of record, where any judgment has been given in a court of record, the parties to the suit are estopped from afterward alleging such matters as would be contradictory to the record. 2. By matter in writing. Thus, a party who has executed a deed is precluded from afterward denying, in any action brought upon that instrument, the fact of which it is evidence. 3. By matter in *pays*, as by livery, by entry, by acceptance of rent, etc.—by any of which acts a man is

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barred from pleading anything to the contrary. The principle of estoppel is that what a man has once solemnly alleged is to be presumed to be true, and therefore he should not be suffered to contradict. The doctrine of estoppel prevails in the United States and England; also in Scotland, under the name of personal exception (q.v.). ESTOP, v. *ēs-tōp'*, to bar; to place under estoppel. ESTOP'PING, imp. ESTOPPED, pp. *ēs-tōpt'*.

ESTOUFADE, n. *ēs-tō-fād* [F. *étouffade*—from OF. *estouffer*; F. *étouffer*, to stuff]: in *cook.*, a mode of cooking meat slowly in a closed vessel.

ESTOVER, n. *ēs-tō-ver* [OF. *estoveir*, to be needful]: in *law*, supply of needful wood for repairs, fuel, etc.; an incident to the estate of a tenant for life or for years. It is the right which the tenant has to make use of the wood on the estate for certain definite purposes. Estovers, or *botes* (Saxon), are of three kinds—house-bote, which is twofold—viz., *estoverium edificandi et ardendi*, a right to wood for fuel and repairs of the house, plowbote, *estoverium arandi*, wood for plows and carts; and haybote, *estoverium claudendi*, wood for repairing hedges and fences.—*Co. Litt.* 41 b. E. is used sometimes also to denote an allowance of food and clothes.

ESTRADE, n. *ēs-trād'* [F.]: a level place; the raised part of the floor of a room.

ESTRANGE, v. *ēs-trānj'* [F. *étranger*, a foreigner: OF. *estränge*, strange—from It. *estraneo*, not native, foreign—from L. *extrānēus*, what is without, a stranger]: to divert from its original use; to alienate; to turn from kindness to indifference or enmity; to withdraw the heart or affections from. ESTRAN'GING, imp. ESTRANGED', pp. *-strānjd'*. ESTRANGEMENT, n. *-mēt*, the withdrawal of the heart or affections from; alienation.

ESTRANGELO, n. *ēs-trānj'gēl-ō* [*e*, not: Gr. *stronggulos*, smooth or even]: a variety of the old Phœnician alphabet, whose characters are heavy and cumbersome; said also to be derived from two Arabic words, signifying 'writing of the Gospel.'

ESTRAPADE, n. *ēs'tră-pād'* [F. a species of torture]: the violent jerking of the hind legs which a horse makes when desirous of getting rid of his rider; also STRAPPADO, n. *străp-pă'dō*.

ESTRAY, v. *ēs-tră'* [OF. *estrayer*, to stray]: in *OE.*, to stray. ESTRAYS', n. plu. *-trăz'*, in *law*, valuable animals, whose owner is not known, found wandering. The law of E. varies in different states; usually cattle at large or doing damage in fields, etc., can be sent to a public pound, and if unclaimed after a fixed time, can be sold for damages and expenses, the balance going to the town-treasury. In some states they are advertized instead of impounded.

ESTREAT, n. *ēs-trēt'* [Norm. F. *estraite*—from L. *extractum*, copy of any original writing; *tractus*, drawn]: true extract copy of any original writing, especially of fines set down in the rolls of a court to be levied of any man for

ESTREEN—ESTREMOZ.

his offenses: see RECOGNIZANCE: V. to copy; to levy fines, etc., under an *estreat*. ESTREAT'ING, imp. ESTREAT'ED, pp. applied to the recognizances when the officer is directed to take out such a copy for the purpose of levying the amount.

ESTREEN, n. *ēs-trēn'*: Scotch for YESTREEN, which see.

ESTRÉMADURA, *ēs-trā-má-dō'rá*: next to Alemtejo, the largest province of Portugal; 6,907 sq. m. The greater part of the country is hilly, but the hills do not attain great elevation. West of the estuary of the Tagus are the granite mountains of the Serra da Cintra, 1,500 to 1,800 ft. in height, terminating in the Cabo de Roca. South of the Tagus are barren moors, partly broken by morasses, and the limestone chain of Arrabida, rising to a height of 1,000 ft., and terminating in the Cabo de Espichel. Many districts are extremely fertile, others barren and uncultivated. The Tagus, which is navigable only as far as Abrantes, receives the waters of the Zezeres, the Sorraya, and the Canha, and is strewn with islands at its mouth. The chief productions of the country are wine, oil, fruits, corn, and cork; but even the sandy plains are covered with cistus, rosemary, myrtles, and other flowering and fragrant plants. The breeding of cattle is not much attended to. The minerals are marble, coal, and sea-salt. This province has been frequently visited by earthquakes.—Pop. including the cap., Lisbon (1877) 951,545; (1881) 946,482.

ESTRÉMADURA: previous to the new distribution of the country, a province of Spain; between Portugal and New Castile, watered by the Tagus and the Guadiana. It is bounded on the n. by Leon, on the s. by Andalusia, and, since 1833, has been divided into the two provinces of Badajoz and Caceres; area 16,554 sq. m. Although a continuation of the high table-land of New Castile, E. is not, like it, a uniform plain, but is mountainous on the n and s., and is well watered, the slopes of the hills being covered with wood, and the valleys with rich grass. Notwithstanding the fertility of the soil, the land has lain desolate and uncultivated ever since the expulsion of the Moors in the 13th c. This is chiefly to be attributed to the Mesta, or right of pasture, which causes the land to be regarded as the common property of the possessors of flocks. The breeding of goats, swine, horses, asses, and mules is much attended to. Silk and honey form considerable branches of trade. Grain is still imported. The mines, formerly very productive, are no longer wrought. Commerce is confined almost entirely to a contraband trade with Portugal. The inhabitants are poor, and, from the want of roads, isolated from the rest of Spain, and consequently in a low state of civilization. They make excellent soldiers, however, and have produced a series of brave *conquistadores* and generals. Pop. (1886) 799,659.

ESTREMOZ, *ēs-trā-mōz'*: fortified town of Portugal, province of Alemtejo, 23 m. n.e. of Evora, and about the same distance e. of Elvas. It is built round the base of the hill

ESTRIDGE—ETAH.

on which its once formidable castle, erected 1360, is placed. It now ranks as the fourth or fifth stronghold in Portugal. E. is famous for manufactures of earthenware; its jars, of a porous clay, with the property of keeping water singularly cool, are of elegant shape, and are used all over the peninsula. The earthenware manufactures of E. seem to have continued unchanged since Roman times, as until the present day the forms into which the jars are cast are purely classical. In the neighborhood of E. is a marble quarry. Pop. (1878) 7,278.

ESTRIDGE, n. *ēs'trij*, or ESTRICH, n. *ēs'trich*: in *OE.*, an ostrich.

ESTUARY, n. *ēs'tū-ā-rī* [L. *æstuariūm*, an arm of the sea—from *æstiūrē*, to rage or boil, as the sea—from *æstus*, heat, surge: F. *estuaire*; It. *estuario*]: the mouth of a tidal river; an arm of the sea; a frith. ESTUARINE, a. *ēs-tū-ā-rīn*, or *ēs'*-, of or pertaining to an estuary; formed in an estuary.

ESURIENT, a. *ēs-ū-rī-ēnt* [L. *esuriēntem*, desiring to eat, suffering hunger]: desirous to eat; hungry: N. one who is hungry; a greedy or avaricious man.

ESZEK, *ēs'sék*: royal free town of Slavonia, on the right bank of the Drave, 12 m. above its confluence with the Danube, is the administrative cap. of the 'Kingdom,' and the most prosperous trading-town of Slavonia. Since the Drave began to be navigated downward to E. by steamers, the town has had prosperous trade in corn, wood, pigs, iron, deals, wine, and flax. The fortress of E., known in Roman times under the name of Mursia, is protected by a fort on the left bank of the Drave. In the fortress, the commander's dwelling and the town-house, and in the lower town the county buildings, are specially noticeable. During the Hungarian revolution, the town was at first held by Count Casimir Batthyányi, but capitulated, after a siege of several weeks, to the Austrian general. More than half the inhabitants are Rom. Catholics, the rest being Greek Catholics, Protestants, and Jews.—*Eszeg* is the Hungarian spelling of the Slavonian name *Essek*. Pop. (1880) 18,000.

ESZTERHÁZY: see *ESTERHAZY*.

ETACISM, n. *ā'ta-sīzm* [F. *étacisme*]: in *philol.*, the method of pronouncing Greek in which the letter *η*, *eta*, has the sounds of *a* in *fate*. In modern Greek this letter has the sound of *ee* in *fleet*. E'TACIST, n. *-sist* [F. *étaciste*]: one who practices or defends etacism.

ETÆREIO, n. *ē-tē'rī-ō* [Gr. *etairía*, fellowship, society]: in *bot.*, a fruit composed of several distinct one-seeded fruits or drupes, arranged upon an elevated receptacle or torus, as in the mulberry.

ÉTAGERE, n. *ā-tā-zhār* [F.—from *étager*, to raise by stages or stories; *étage*, a stage, a story]: a set of shelves in the form of an ornamental standing-piece of furniture, used for the display of articles of vertu.

ETAH, *ē'tā*: district of British India, in the division of Agra; between lat. 27° 20' 30" and 28° 1' n., and long.

ÉTAMPES—ET-CETERA.

78° 29' and 79° 20' e.; 1,512 sq. m. It is an elevated alluvial plateau, with more than half its area under cultivation, and yields two harvests a year of wheat, barley, pulse, millet, cotton, sugar-cane, indigo, and opium. The Ganges river is the principal means of transportation. E. has 8 towns with pop. exceeding 5,000, and 5 municipalities. It was the seat of a primitive Aryan civilization, rich in temples and monasteries. Pop. (1872) 703,527.

ÉTAMPES, *ā-tōngp'* (anc. *Stampæ*): town of France. dept. of Seine-et-Oise, 32 m. s.s.w. of Paris, on the Orleans railway. It consists mainly of one street, about four m. long. The chief buildings are the ecclesiastical edifices. E. has a public granary, capable of containing 1,400 tons of wheat. In and around E. are more than 40 flour-mills, constantly employed in providing for the Paris market; considerable quantities of garden-stuff are sent from this neighborhood to the capital. Pop. 8,000.

ÉTANG DE BERRE, *ā-tōng'dēh bār*: salt-lake of France, in the s. of the dept. of Bouches-du-Rhone, 11 m. long and 9 wide (at widest part), communicating with the sea by a narrow channel, called Tour-le-Bouc. This lake contains great quantities of eels and other fish. Salt-works are on its banks.

ETANIN, n. *ēt'a-nin* [corrupted Arab]: in *astron.*, a fixed star of the second magnitude, called also γ Draconis. By it Bradley discovered the aberration of the fixed stars.

ÉTAT-MAJOR, n. *ā-tā-mā-zhawr'* [F.]: in *mil.*, the staff of an army or regiment. It includes all officers above the rank of colonel; all adjutants, quarter-masters, inspectors, engineers, commissaries, ordnance officers, paymasters, surgeons, judge-advocates, and their non-commissioned assistants. In the department of military map-making, the English Ordnance Office corresponds in some respects with the French état-major.

ETAWAH, *ēt-ā-wā*, or ITAWA *īt-ā-wā*: district of which the town of Etawah is cap.; the lieut.-governorship of the N.W. Provinces. It lies entirely in the basin of the Jumna, and almost exclusively within the Doab, stretching in n. lat. 26° 21' to 27° 9', and in e. long. 78° 46' to 79° 49'; 1,694 sq. m. The district was at one time famous for the murderous fanaticism of the Thugs, 67 corpses of their strangled victims having been found in the wells during a single year. Pop. (1881) 722,371.

ETAWAH: town of the Doab, near the left bank of the Jumna, about 70 m. below Agra, lat. 26° 46' n., and long. 79° 4' e. Though it is, on the whole, a dreary and mean place, yet it presents some remains of ancient grandeur, particularly many of those ghats or flights of stairs which facilitate the approach to the river for ritual ablution. Its prosperity, such as it is, is due chiefly to its position at the junction of the two roads which lead to Agra from Cawnpore and Calpee. Pop. (1881) 34,721.

ET-CETERA, or -CÆTERA, *ēt-sēt ē-rā* [L. *et*, and; *cætērā*, other things]: commonly contracted into &c. or etc.—put

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at the end of a sentence, title, or announcement, to point out the fact that *other things* could be mentioned, or are to be understood as following; and so on. ET CÆTERA OATH, n. an oath imposed on the clergy by the Anglican bishops 1640, 'binding them to attempt no alteration in the government of the Church by bishops, deans, archdeacons, etc.'

ETCH, v. *ěch* [Dut. *etsen*, to etch—from Ger. *ätzen*, to cause to eat]: to engrave a metal plate by the eating or corroding power of an acid. ETCH'ING, imp.: N. the art of producing a picture on a metal plate by the eating power of an acid; the impression from the plate. ETCHED, pp. *icht*. ETCH'ER, n. one who. ETCHING-GROUND, the substance, usually a mixture of wax and resin, used to protect the surface of the metal, etc., from the action of the acid. ETCH'INGS, n. plu. impressions upon paper of designs etched on a plate of copper, steel, etc.: see HATCH, and note: also ENGRAVING.—ETCHING ON GLASS: see GLASS.

ETCHEMINS, *ět'che-mînz*: ancient tribe of American Indians, supposed to have belonged to the Abenaki nation and to have lived along the St. Croix river. They are now represented by the Penobscot and Passamaquoddy families, who occupy extensive reservations in the e. part of Me., adhere to the Rom. Cath. Church, and have schools and churches of their own. The families are about equally divided and aggregate 1,000.

ETCHMIADZIN, *ětch-mě-ăd-zěn'*, or ECHMIEDZIN, or EDCHMIADZIN, or ITSMIADZIN: town and monastery of Russia, govt. of Erivan; in the plain of the Araxes river, 12 m. w. of Erivan, 30 m. n. of Mount Ararat; elevation above sea level 2,985 ft.; seat of the Catholicos or primate of the Armenian Church. The monastery has the appearance of a strong fortification, and consists of a number of buildings, surrounded by brick walls 30 ft. high, provided with loop holes and towers. The cluster forms a quadrangle, on the w. side of which is the residence of the Catholicos, on the s. the refectory, on the e. the monks' lodgings, and on the n. the cells. There is a small cruciform cathedral, with two towers, a remarkable porch of red porphyry, and very rich interior decorations, where the Catholicos confers episc. consecration, and, once every 7 years, prepares the holy oil for use in all Armenian churches. The cathedral is said to number among its sacred relics the head of the spear which pierced the Savior's side, a piece of Noah's ark, and a piece of the true cross. Outside the main entrance are alabaster tombs of the Catholici Alexander I., Alexander II., Daniel, and Narses, and a marble monument over the grave of Sir John Macdonald, who died 1830 while on a mission to the Persian court. About half a mile from the cathedral are two churches, memorials to St. Rhinsime and St. Gaiana, early martyrs of Armenian Christianity, the latter being used for the burial place of all primates not pronounced by the synod worthy of interment beside the cathedral. Connected with the monastery is a library, said to have contained at one time 15,000 vols., but now reduced to about



Esquimaux Dog.



Estoile.



Eucalyptus Amygdalina.



Euterpe, from the Vatican.

ETERNAL—ETHELBERT.

2,500. These, however, furnish a rich storehouse of Armenian literature, and include ms. copies of the Gospels in carved ivory binding of the 10th or 11th c., and Bibles of the 13th c. A complete printing establishment, with type-foundry, presses, and book-binding requisites, is maintained by the monks, who publish a weekly newspaper, *The Ararat*, and various religious and educational works. A modern college and seminary stands e. of the monastery. The monastery is supported by an average annual revenue of \$50,000, derived from the conventual domains, which include a number of estates and 5 Russian villages. In 1872 the inmates numbered 5 bps. and abps., 20 monks, and 25 novices, and the pop. of the town was abt. 8,000. The monastery was founded by Narses II. who ruled 524-53, and since 1441 E. has been the centre of the Armenian Church.

ETERNAL, a. *ē-tēr'nāl* [F. *éternel*, eternal, perpetual—from L. *æternālis*—from *æternus*, perpetual—from *ævum*, an age; akin to Skr. *ājus*, life: It. *eternale*]: without beginning or end of existence; without an end. everlasting; existing always without change: N. a title of Deity. **ETER'NALIST**, n. *-nāl-ist*, one who holds the existence of the world to be eternal. **ETER'NALLY**, ad. *-lī*. **ETER'NITY**, n. *-nī-tī*, duration without beginning or end; endless future existence. **ETER'NIZE**, v. *-nīz*, to make endless; to immortalize. **E'TERNIZING**, imp. **ETER'NIZED**, pp. *-nīzd*. **ETERNAL CITY**, Rome, capital of Italy. **ETERNAL PUNISHMENT**: see **HELL**: **IMMORTALITY**. *Note*.—In popular usage, *eternal* and *everlasting* are very much used as synonymous. In the original Biblical use of the terms, however, *eternal* has for its primary significance, 'beyond all conditions of time.'—**SYN.** of 'eternal': endless; infinite; ceaseless; interminable; perpetual.

ETERNE, a. *ē-tēr'n*: in *OE.*, perpetual; endless.

ETESIAN, a. *ē-tē'zhī-ăn* [Gr. *etesios*; L. *etesius*, annual—from Gr. *ētis*, a year: F. *étésien*]: periodical; denoting a northerly or north-easterly wind that prevails all over Europe in early spring; in *Gr.* and *Rom. authors*, applied to the periodical winds in the Mediterranean, from whatever quarter they blow.

ETHANE, n. *ē'thān* [Eng. *ether*; termination used to denote that the hydrocarbon belongs to the series, C_nH_{2n+2}]: a hydrocarbon belonging to the paraffine series, obtained by the action of water, added drop by drop to zinc ethyl; also by the electrolysis of acetic acid or acetates; by heating an excess of barium dioxide with sand and acetic anhydride.

ETHELBERT, *ēth'el-bért*, King of Kent: abt. 552-616 (reigned abt. 560-616); fourth in direct descent from the great Hengist. He succeeded to the throne in about the eighth year of his age. The representative of the first Saxon king who ruled in England, and envious on that account of the title of Bretwalda, then held by Cealwin of Wessex, E. rashly undertook an expedition against that king in 568, a venture which, had he known the extent of country

ETHELREDA—ETHER.

covered by the West Saxons, he would probably never have made. The rival kings met at Wimbledune, now Wimbledon, in Surrey, where a great battle took place, resulting in the defeat of Ethelbert. This is recorded as the first battle that ever occurred between Anglo-Saxon sovereigns. Taught by disaster and danger, E. became more prudent. His subsequent schemes were more successful, and, about 590, he was acknowledged as Bretwalda of the Saxon octarchy, a dignity which he maintained to the close of his reign and life. In 570, E. married Bertha, a Frankish princess. The lady was a Christian, and it is said had stipulated, as a condition of her marriage, that she should be allowed, after her arrival in Kent, to practice her own religion. Her amiable piety had completely disarmed E. of all violence against the Christian religion long before the most important event of his life took place, viz., the formal introduction of Christianity into his kingdom. This was effected by the ministrations of St. Augustine, who was sent to Britain by Pope Gregory, and who landed in Kent 596. In the following year the king himself was converted, and Christianity established among the hitherto pagan Saxons. After his conversion and baptism, he founded the bishopric of Rochester, and, in concert with his nephew Sebert, King of Essex—who also had been converted—erected the church of St. Paul's in London.—E. is distinguished as the author of the first written Saxon laws. These are the *Dooms*, as they are called by Bede, 'which he established with the consent of his Witan in the days of St. Augustine.' They are in the Saxon language, and are the earliest written laws extant in any modern tongue.

ETHELREDA, *éth-él-ré'da*, SAINT: daughter of the king of the East Angles, in the 7th c.; canonized for her saintly virtues, and whose festival in the calendar is Oct. 17. Her name was popularly abbreviated or corrupted into St. Audrey. At a fair in the Isle of Ely, called after her St. Audrey's Fair, it was customary to sell a common kind of lace, which came to be known as St. Audrey's lace. *Tawdry*, as applied to any inferior, and showy material, is believed to be a corrupt use of the term St. Audrey.

ETHENE, n. *éth-ên* [adapted from *ether*]: heavy carburetted hydrogen or olefiant gas; also called *ethylene*.

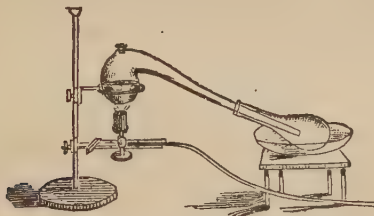
ETHENYL, n. *éth-ên-ül* [Eng. *cthene*; Gr. *hulē*, matter]: triatomic fatty hydrocarbon radical derived from ethane, C₂H₃, by the abstraction of three atoms of hydrogen.

ETHER, n. *éth-ér* [F. *éter*—from L. *æther*; Gr. *aithēr*, the upper or pure air: It. *etere*]: an extremely fine fluid, supposed to fill all space beyond the limits of our atmosphere (see **ETHER**, or **ÆTHER**); a very light, volatile, and inflammable liquid, obtained from alcohol and an acid by distillation; the oxide of an acid radical. **ETHE'REAL**, a. *-thér-ri-ál*, heavenly; spiritual; celestial; resembling ether. **ETHE'REALLY**, ad. *-lí*. **ETHE'REAL'ITY**, n. *-ál'i-ti*. **ETHERIZE**, v. *éth-ér-íz*, to convert into ether; to stupefy with ether; to make spiritual. **ETHE'REALIZE**, v. *-ál-íz*. **ETHE'REALIZING**, imp. **ETHE'REALIZED**, pp. *-ízd*. **ETHERIFICATION**,

ETHER.

n. *ē-thēr'ī-fī-kā'shūn* [*L. faciō, I make*]: the act of making ether from alcohol. **ETHERIFORM**, **n.** *ē-thēr'ī-fawrm* [*L. forma, shape*]: having the form of ether. **ETHERINE**, **n.** *ē-thēr-in*, substance combined with etherol to form a light oily liquid that rises to the surface when heavy oil of wine is warmed with water. **E'THERISM**, **n.** *-izm* [*Eng. ether; F. éthérisme*]: in *med.*, effects produced on the human frame by the administration of ether. **ETHERIZA'TION**, **n.** *-ī-zā'shūn* [*F. éthérisation*]: in *chem.*, process of manufacturing ether; in *med.*, art or act of administering ether to a patient; the state of the human frame under the influence of ether.

ETHER (otherwise called **ETHYLIC ETHER**, or **VINIC ETHER**, or **SULPHURIC ETHER**): extremely volatile liquid, prepared from alcohol by the action of sulphuric acid at an elevated temperature. On the small scale, the apparatus which may be employed for the purpose is the retort and receiver, into which a mixture of equal weights of spirits



of wine, or rectified spirit and oil of vitriol, or, by volume, 2 of alcohol and 1 of sulphuric acid. are placed, and heat being cautiously applied, a liquid distils over, which consists of ether and water. In a short time, the contents of the retort begin to blacken, and the operation must be stopped, or the distillate will become contaminated with sulphurous acid. On the large scale, a modification of the process is carried on, which renders it theoretically a 'continuous process,' though, practically, there is a limit to the amount of ether distilled over.

The conversion of alcohol (C_4H_5O, HO) into ether (C_4H_5O) and water (HO) by oil of vitriol ($HOSO_3$), was at one time considered to be due simply to the strong affinity of the oil of vitriol for water, which enabled it to take possession of the one atom of water, the elements of which form the only difference in the ultimate composition of alcohol and ether. This simple mode of explaining the process of etherification, however, does not acknowledge that the atom of water is not retained by the oil of vitriol, but is given off side by side with the ether in mechanical solution therewith. The theory of the process now generally accepted is too complex for introduction here.

Ether is a colorless, transparent, volatile liquid of great mobility and high refractive power with a fragrant odor, and a fiery, passing to a cooling, taste. When pure, it has the specific gravity 720 (water = 1000) at $60^\circ F.$, though the commercial specimens are never free from water and alcohol, and have the density 740. It boils at $94.8^\circ F.$

ETHER.

(the commercial at 96°), and yields a very dense vapor, the specific gravity of which is 2,586, as compared with air 1,000. When reduced to a temperature of -24°F. , ether freezes. It volatilizes spontaneously when unconfined, as in the palm of the hand, and vaporizes so quickly as to produce intense cold. Indeed, when water is covered with ether, and the latter assisted in its evaporation by being blown upon, it escapes so readily as to reduce the temperature of the water to 32°F. , when it freezes. It is very inflammable, burning with a yellow-white flame; and mixed with air or oxygen, it gives rise to a dangerous explosive mixture, and hence great care requires to be taken in its distillation to keep all lights and fires out of the room where the vapors are condensing. When ether is added to its own bulk of water, briskly agitated, and allowed to settle, the two liquids appear to separate again; but it is found that the ether has taken up one-eighth of its volume of the water, while the latter has dissolved the same quantity of ether. It is readily miscible with alcohol in all proportions. Ether is one of the best solvents for the oils and fats, and hence is employed in analysis for the solution and separation of the oils from other organic matters, as in the analysis of oil-cakes, etc. It is also a good solvent of iodine, sulphur, phosphorus, and of strychnine, and other alkaloids, as well as corrosive sublimate, and other salts.

Ether is useful in the preparation of freezing mixtures, and the mixture of ether and solid carbonic acid gives the lowest temperature as yet attained. When inhaled by man and the lower animals, ether first produces stimulating and intoxicating effects, but afterward it gives rise to drowsiness, accompanied by complete insensibility, which entitles ether to be regarded as an important anæsthetic agent; and, indeed, for some time it was the only agent used for producing anæsthesia (q.v.) in surgical operations, but has been entirely superseded by the employment of chloroform.

Ether enters into combination with many acids, forming compound ethers, possessing great fragrantcy; the more important of these are the following:

Acetic Ether,	$\text{C}_4\text{H}_5\text{O}.\text{C}_4\text{H}_3\text{O}_3$.	
Butyric Ether,	$\text{C}_4\text{H}_5\text{O}.\text{C}_8\text{H}_7\text{O}$,	Pine-apple Oil.
Caproic Ether,	$\text{C}_4\text{H}_5\text{O}.\text{C}_{12}\text{H}_{11}\text{O}_3$ }	Essence of Melons.
Rutic Ether,	$\text{C}_4\text{H}_5\text{O}.\text{C}_{20}\text{H}_{19}\text{O}_3$ }	
Pelargonic Ether,	$\text{C}_4\text{H}_5\text{O}.\text{C}_{15}\text{H}_{17}\text{O}_3$,	Essence of Quinces.
œnanthic Ether,	$\text{C}_4\text{H}_5\text{O}.\text{C}_{14}\text{H}_{13}\text{O}_2$,	Wine Oil.

There are other ethers, in which ordinary ether is not one of the members, as

Amyl Acetic Ether,	$\text{C}_{10}\text{H}_{11}\text{O}.\text{C}_4\text{H}_3\text{O}_3$,	Jargonelle Pear Oil.
Amyl Valerianic Ether,	$\text{C}_{10}\text{H}_{11}\text{O}.\text{C}_{10}\text{H}_9\text{O}_3$,	Apple Oil.
Methyl Salicylic Ether,	$\text{C}_2\text{H}_3\text{O}.\text{C}_{14}\text{H}_5\text{O}_5$,	Oil of Winter Greens.

ETHER, sometimes ÆTHER: the medium assumed in astronomy and physics as filling all space. It was shown by Newton, that if light consisted of material particles projected from luminous bodies, these must move *faster* in solids and liquids than in air, in order that the laws of refraction might be satisfied in their motions. Huyghens, on the other hand, showed, that to account for the same

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laws on the supposition that light consisted in the undulatory motions of an elastic medium, it must move more *slowly* in solids and fluids than in gases. Fizeau and Foucault have lately, by different methods, measured these velocities relatively, and have found Huyghens's prediction correct. Light, then, in the theory now accepted, consists in the vibratory motion of a medium, which must, of course, fill all space. This is called Ether. As yet, we have no idea as to its ultimate nature; some of our greatest philosophers, even, have supposed that it may be of the class of ordinary gases, and that our atmosphere, for instance, is not finite in extent, but pervades, with greatly reduced density, all interplanetary and interstellar space. Many objections, however, may easily be raised against this supposition. Meanwhile, the mathematical theory of light, on the hypothesis of undulations, requires that the vibrating medium should possess properties more nearly allied to those of an elastic *solid* than those of a liquid or a gas. The ether being *required* theoretically for explanation of the existence and the propagation of light, it becomes a matter of importance to inquire how many more of the physical forces may be referred to the same cause or medium. Radiant heat certainly may, and, probably, gravitation, molecular actions, magnetic, electric, and electro-dynamic attractions and repulsions, also are to be thus explained. As to sensible and latent heat, electricity and magnetism themselves, the necessity is not so clear; but even these have been of late *almost* satisfactorily explained by the hypothesis of the all-pervading ether: see FORCE: also see the same in reference to the impossibility of the ether's consisting of air or other gases, which are made up of distinct and separated particles.

ETHERIA, or ÆTHERIA, n. *ē-thēr'ī-a* [L. *ætherius*; Gr. *aitherios*, belonging to the ether or upper air]: in *zool.*, genus of mollusks, family *Unionidæ*. Known species four, from the Nile and the Senegal rivers. According to M. Calliard, the natives of the upper parts of the Nile valley use the shells in astonishing numbers to ornament their tombs.

ETHEROGRAPHY, n. *ē-thēr-ōg'rā-f'ī* [Gr. *aither*, the upper or pure air; *graphō*, I write]: a description of the atmosphere, its nature, uses, and phenomena; aerology.

ETHEROL, n. *ē-thēr-ōl* [Eng. *ether*; L. *oleum*, oil]: in *chem.*, a yellowish viscid liquor obtained from heavy oil of wine. Sp. gr. 0.921; boils at 280°.

ETHERSPHERE, n. *ē-thēr-sfēr*: in *physics*, term introduced by the Rev. S. Earnshaw to illustrate an hypothesis of his. He considers that all space not filled by matter is filled by ether. If from any cause a portion of space be rendered void of this subtle existence, the medium outside the space will press it into smaller compass, and, if there be in it an atom of matter, the ether around it will become more dense under the influence of the pressure. The ethersphere is then the excess of ether about the vacant space above its original amount or quantity.

ETHICS.

ETHICS, n. plu. *ēth'iks* [L. *ethicūs*; Gr. *ethikōs*, moral—from Gr. *ēthōs*, manners, usage: F. *éthique*, ethics]: the science which treats of morality; that which relates to human actions, their motives and tendencies. ETH'IC, a. -*ik*, or ETH'ICAL, a. -*ī-kāl*, treating of manners or morals; moral. ETH'ICALLY, ad. -*lī*. ETHICIST, n. -*ī-sist*, a writer on ethics; one learned in ethics.—*Ethics* has primarily the same meaning as the more familiar term *Morals*. The science, treating of the nature and grounds of Moral Obligation, and expounding our various duties, is called sometimes by the one term, and sometimes by the other. This is a subject wherein opinions widely different from each other have been, and are still held. Hence, first to be considered is what are the chief points in dispute; and next, the positions taken by the opposing schools.

There are two distinct questions connected with the Theory of Morals. The first is the properly ethical question, and is, what is the criterion of a moral act? otherwise expressed as the moral standard—the circumstance determining an action to be right, and not wrong, nor simply indifferent as regards right or wrong. What determines our judgment in giving to some conduct moral approbation, and to other conduct moral disapprobation? We consider murder, theft, breach of promises or contracts, resistance to authority, cruelty, ingratitude, slander, polygamy, to be wrong or immoral, and the science of ethics is called upon to assign the reasons, why these various actions are so accounted.

The other question is properly psychological; in other words, relates to the constitution of the human mind. It is, by what faculty of our nature do we recognize this difference in actions? Is it by one of our ordinary intellectual faculties, such as Reason? or by some of our emotional susceptibilities, as Love and Hatred? or by a mixed faculty like Prudence? or by something peculiar and distinct, relating to this one object and no other, as the eye is formed for recognizing only color, and the ear only sound? This question has been often improperly mixed with the other, though there are certain theories wherein the answer to the first depends on the answer to the second.

As regards the standard of morals, it should be premised that punishment for neglect is what shows an action to be obligatory. We may dislike a man's conduct; but if we do not consider it deserving of punishment, it is not immoral in our eyes. People's imprudences, whereby they hurt themselves alone, are disapproved of; but there is seldom any disposition to step in by way of penalty in order to prevent such conduct; the disapprobation, therefore, is not of the moral kind. It may be said, however, that there is a tacit recognition of a sufficient punishment provided and sure to accrue in the nature of things. The punishment inflicted by society is partly legal, or through the civil government; and partly by public opinion, which, by attaching a stigma to certain conduct, is able to inspire no less dread than the civil authority. The punishment, by society acting in this way, is sometimes called the popular

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sanction, to distinguish it from the legal sanction. *Dishonor* is another name for the same thing. Many kinds of conduct tolerated by law, are nevertheless punished by the loss of public esteem and the infliction of disgrace. Cowardice, eccentricity, heterodoxy beyond certain limits, expose the individual to public censure. Many kinds of inhumanity, as maltreating dependents, have no other check than expressed disapprobation.

There have been various theories to show what is the principle of selection in the singling out of some actions to be authoritatively forbidden by Law and Society—that is, forbidden by the sanction of punishment. Some have said that the will of the Deity, or divine revelation, has indicated what we are not to do, and that there is nothing left to us but to conform to what is thus prescribed; others, as Cudworth, maintain, on the contrary, that what the Deity commands must be such as our own conscience approves, otherwise we could not give Him the character of being independently good and just. It has been said that Right Reason shows us the difference between right and wrong; this was Cudworth's own view: it may be conceived as another form of stating that a more or less bright and sure, yet always actual revelation of God exists in man's own nature, constituting his true and highest Reason, and varying in different men as all intellectual and physical powers vary. Samuel Clarke conceived that there was an eternal and intrinsic *fitness* in the things considered as right, and an unfitness in the wrong, 'with a regard to which the will of God always chooses, and which ought likewise to determine the wills of all subordinate rational beings.' Both these writers aimed at replying to Hobbes, who had maintained that the Civil Magistrate is supreme in Morality as well as politics; meaning, however, in all probability, that the magistrate himself ought to frame his dictates in one, as in the other, with a view to the public good, which would be a Utilitarian view. The phrase, 'the Moral Sense,' which represents what has been perhaps the most prevalent moral theory, occurs first in Lord Shaftesbury's *Inquiry Concerning Virtue*, from whom it was adopted by Hutcheson, and has since passed into general currency. Sometimes it has been maintained that a regard to self-interest is the only ultimate rule of right, which has a very different meaning, according as we look at self-exclusive, or inclusive, of other men's well being. The most enlarged benevolence, in one view, is but an aspect of self. Adam Smith, in his *Theory of Moral Sentiments*, laid down as the criterion of right, the 'sympathetic feelings of the impartial and well-informed spectator.' But though this theory acknowledges our bias in the capacity of agents, it presumes us to be infallible when acting as judges or critics, a position far from self-evident. The spectator has his own failings as well as the actor, unless specially qualified by nature and education to act the part of a moral judge. Jeremy Bentham is known as the most distinguished propounder of the principle of Utility as the basis of morals, a principle explained by him as in contrast, first to asceticism, and next to 'sym-

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pathy and antipathy,' by which he meant to describe all those systems, such as the Moral Sense theory, that are grounded in internal feeling, instead of a regard to outward consequences. In opposing Utility to Asceticism, he intended to imply that there was no merit attaching to self-denial as such, and that the infliction of pain, or the surrender of pleasure, could be justified only by being the means of procuring a greater amount of happiness than was lost. Paley also repudiated the doctrine of a Moral Sense, and held that virtue is 'the doing good to mankind, in obedience to the will of God, and for the sake of everlasting happiness. The utilitarian theory of Bentham, with various modifications, has been defended and expounded by James Mill, in his *Analysis of the Human Mind*, and in his anonymous *Fragment on Mackintosh*; by John Austin, in his *Province of Jurisprudence Determined*; and by Mr. John Stuart Mill in his *Dissertations and Discussions*, and in *Frazer's Magazine* (1861, Oct. to Dec.).

The great controversy may be said to be between the adherents of the Moral Sense in some form or other, and those that deny both the existence of a separate faculty in the mind for perceiving moral distinctions, and the validity of the determinations of the individual conscience; maintaining (for in this form the assertion usually is presented) that morality ought to be founded on a regard to the well-being of mankind, and that exclusively; and that rules of morality grounded on any other motives are indefensible. In short, the question has been prevalently stated as being—and has actually, whether or not necessarily, come to be—Is morality an intuition of the mind, or is it like the government of the state, a positive institution, on which different societies may differ, and which may be set up or be abrogated at the pleasure of society?

The theory of intuitive Morality was vigorously assailed by Locke in his *Essay on the Understanding* (book i. chap. 3); and the party which he represents are accustomed to say that his objections to what he called 'innate practical principles' have never been answered. These objections have been given in a condensed form by Paley (*Moral Philosophy*, book i.). Locke urged that, in fact, there are no principles universally received among men; that moral rules require a reason to be given for them, which ought not to be necessary, if they are innate; that virtue is generally approved of, not because innate, but because profitable; that innumerable enormities have been practiced in various countries without even causing remorse; that the moral rules of some nations are flatly contradicted by others; that no one has ever been able to tell what the innate rules are; that we do not find children possessed of any moral rules, etc. To the objection, founded on the great variety and opposition of moral rules in different places and times, it has been replied that though the substance of the moral codes differ—one part of the world being monogamous and chaste, while other nations allow promiscuous intercourse of the sexes—all agree in enjoining some moral rules; nowhere is there an absence of social

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and moral obligations. The rejoinder has been that this is to depart from the original question, which was to assign the standard of morals, the criterion for determining which of two opposite courses—monogamy or polygamy—is the correct or moral course. This rejoinder brings to view one old and ever recurrent cause of confusion in this debate; the Utilitarians, making good their claim that moral rules often do, and presumably always should, *proceed* according to considerations of utility, unconsciously shift or enlarge that claim till it comes to this which is quite different—that rules of morality neither are nor should be ‘grounded on any other motives’ than utility. To show that utility is one of the useful or even indispensable criteria in moral processes, is not the same as showing that utility is the only foundation of morality itself. The intuitive moralists say that human nature is endowed with a faculty which tends to set up a discrimination between right and wrong, and which goes on to approve the right and disapprove of the wrong, and that we need not look beyond our own conscience to settle the point. The Utilitarians say, that when the existence of contradictory consciences is pointed out, it is not to the purpose to say that these are still consciences, and indicate something as obligatory; this all admit: what we desire is, to determine which we are to follow. But this criticism, though true, is not pertinent to the question as to the foundation, but only as to the proper exercise, of moral judgment: the intuitive moralist may reply with a similar criticism, relative to the contradictory views as to what actions are for true utility, or really tend to welfare.

Dr Whewell, in his *Elements of Morality*, has proposed to solve the difficulty by setting up a supreme or Standard Conscience, by which the individual conscience may be squared and corrected; but he has not told us who are the men whose conscience is the standard; it being obvious that the human race, as a whole, do not recognize any such, though each separate community might consent to take as models some of its most estimable citizens, or the interpreters of its religious code. The suggestion will arise in some minds that the supreme or standard conscience can be found by man only through some kind of manifestation of the Infinite and Eternal One.

The following is one view of the nature and origin of our moral principles which would seem free from the grave objections above alluded to. If we set aside for the present the question as to the *proper* standard of morals, the criterion that we should consider the right criterion, if we had to enact a code of morals for the first time, and if we look at the moral principles that have prevailed in different nations and times, we shall find that they have been dictated from two distinct kinds of motives. The one is Utility, in the sense of the common safety of men living in society. The prohibitions against manslaying, theft, breach of bargain, rebellion, are necessary, wherever men have formed themselves into communities; and it is the agreement in such matters as these—though subject still

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to very great varieties—that makes up the amount of uniformity actually observed in the moral codes of nations. If the society did not agree to protect life and property, by punishing the murderer and the thief, nothing would be gained by coming under the sway of government, and human beings would not associate themselves in tribes or nations. The common end might give a common character to the means, without supposing a special instinct to suggest that stealing is wrong. But, in the second place, there have been, in the moral codes of all countries, prohibitions not connected with any public utility, but prompted by strong sentimental likings or aversions, which have acquired the force of law, and are made the foundation of compulsory enactments. Of this kind is the antipathy of the Jew and the Mohammedan to the pig, the Hindu repugnance to animal food generally, and the usages of a merely ceremonial kind prevailing among many nations, which are as stringently enforced by law and public opinion as the sacredness of life and property. For a woman, among the Mussulmans, to expose her face in public, is as great an offence as going naked would be with us; while, among savage tribes, in warm climates, where clothing is little required, it is no shame to expose the whole person. For these practices, no reason can be given; the public sentiment has determined some things to be right and others wrong, without reference to any public or private utility; and it is in these enactments, founded on liking or disliking, that nations have differed most widely, the difference often amounting to contrariety. The ancient Greeks held it as a sacred obligation to drink wine in honor of Dionysus (Bacchus); the Nazarenes among the Jews and the Mohammedans entertained an opposite view. A legislator for the North American Indians might prohibit alcoholic liquors on the ground of public utility, the natives not being able to control themselves under stimulants; but the prohibition of wine in those other instances is probably a species of asceticism, or an aversion to human pleasures as such, which belongs to the domain of sentiment, and not to the consideration of utility.

There is, probably, an increasing tendency to recognize the supremacy of the principle of Utility both in Morals and in Legislation. Justice, truth, purity, though still sometimes viewed sentimentally, or as being ends themselves, are in men's practice looked upon more and more as of the nature of *means*, the promotion of human happiness being the end. See END (in Ethics). On this vexed question the final philosophy is probably not yet with us. When reached it will probably be found to involve the absolute and eternal Right as the only *foundation* of moral obligation,—the Right being recognized by man through some Divine manifestation to him or in him; and it will probably be found to present on this eternal foundation, the happiness or well-being of creatures as the *guiding principle* in all applications of morality in action and life.

The utilitarians point to a great number of the existing moral rules as traceable to a distinct historical origin, prov-

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ing that in their specific form as rules, they are not given by a universal instinct of the human mind. The Mohammedan code of morals came from Mohammed; Confucius was the moral legislator of one large section of the Chinese. The making of the marriage tie irrevocable in Christendom was an exercise of papal authority in the 13th c., and has since been repealed in some Protestant countries, although retained in Rom. Catholic states: see DIVORCE: MARRIAGE. The sentiment which forbids the holding of human beings as slaves is chiefly the growth of the last two or three centuries. But we are to avoid confusing real morality with legal morality: the two are cognate, but belong in diverse spheres—the legal having only indirect reference to character, and being developed principally in the sphere of public utility.

Although the doctrine of intuitive morality is, in this view, denied, it is still generally admitted by utilitarians that there is such a power in the mind as Conscience, which warns us when we are doing wrong, and is to a certain extent a force to make us do right. But they claim that it cannot be shown that we are born with any such principle, combining both enlightenment and motive power. Conscience is a *growth*. There are—thus they aver—in our constitution certain primitive impulses that so far coincide with what is our duty, and therefore contribute to the formation of the Conscience; these are principally Self-preservation, or a regard to ourselves, and Sympathy, or a regard to others. There are many duties that we are prompted to for our own interest, such as telling the truth, in order that people may confide in us; obeying the laws, to avoid punishment, etc. But we cannot perform all our social duties if we look merely to ourselves. We must, in addition to prudence, have a source of *disinterested* action, inducing us both to avoid injuring our fellow-beings in the promotion of our own selfishness, and occasionally to sacrifice ourselves for the sake of others. Such a principle exists in our mental nature, though not of equal strength in all minds. Being provided with these two primitive springs of action, we are susceptible of being educated to the sense of moral obligation. The child is first taught obedience by penalties, and is made to associate pain with forbidden actions. This is the germ of conscience. Habits of avoiding what is prohibited under penalties are gradually formed, and the sense of Authority and Law is thereby acquired. When the powers of observation and reason come to maturity, the individual sees why the restrictions of duty have been imposed, and is then ready of his own accord, and apart from the fear of punishment, to behave rightly. The Conscience, grounded on Fear, then becomes the Conscience grounded on spontaneous approval.

Conscience thus follows, and does not precede, the experience of human authority. Authority, sanctioned by punishment, is the type and the starting-point, even when the conscience takes an independent flight, and adopts

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rules for itself different from those that entered into its education. The great mass of human beings have nothing more than the slavish conscience, or the habits imparted by the exercise of the parental and public authority, which shows what is the most natural foundation of moral sentiment. The persons that judge of right for themselves, instead of implicitly receiving the maxims peculiar to the society where they grow up, are so few as to be the exception everywhere; their conscience does not prove what is the usual endowment of human nature in this respect.

Much in such views must instantly be conceded. But their precise bearing on the question at which they aim is denied by intuitive moralists, who point out that if Conscience be indeed a '*growth*,' it must grow from something, which something must be of a nature like unto it; and it is this moral germ in man's nature which is claimed as against the theory that grounds all morals and obligation on Utility. See UTILITY.

Inquiries of the nature of those above sketched, proceed upon the assumption that moral distinctions have their ground in the constitution of the world and of man's nature, and may be discovered by the exercise of human reason, as the other laws of the universe are. But practically, the rules of morality have, in almost all communities, been more or less dependent upon a belief in divine laws supernaturally revealed. For the relation of these to scientific ethics, see REVELATION.

ETHIDE, n. *ē'thīd*: compound formed by the union of an element with the monad radical ethyl C_2H_5 —e.g., Zinc Ethide, $Zn''(C_2H_5)_2$, generally called Zinc Ethyl.

ETHIDENE, n. *ē'thī-ĭ-dēn* [from *ether*, and Gr. *eidos*, resemblance]: a substance nearly related in chemical composition to chloroform; a substance isomeric with ethene, and related to aldehyde.

ETHINE, n. *ē'thīn*: in *chem.*, C_2H_2 or $HC = CH$, a hydrocarbon called also acetylene.

ETHIONATE, n. *ē'thī-on-āt*: a salt of ethionic acid.

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ETHIOPIA, *ē-thĩ-ō-pĩ-a*: the biblical *Kush*. Originally, all the nations inhabiting the southern part of the globe, as known to the ancients; or rather, all men of dark-brown or black color, were called Ethiopians (Gr. *aitō*—*ōps*, sun-burned). Later, this name was given more particularly to the inhabitants of the countries s. of Libya and Egypt, or the Upper Nile, extending from 10°—25° n. lat. 45°—58° e. long.—the present Nubia, Sennaar, Kordofan, Abyssinia. The accounts which the ancients have left with respect to this people are, even when not entirely fabulous, extremely scanty and untrustworthy, as both Greeks and Romans never passed beyond Napata, 19° n. lat. From the Homeric age down to Ptolemy—who is somewhat better informed—these regions were reported as peopled by Pygmies, Troglodytes (dwellers in caverns), Blemmyes (hideous men), Macrobian (long-lived men), etc., besides being divided into the lands of cinnamon, myrrh, of elephant-eaters, fish-eaters, tortoise-eaters, serpent-eaters, etc. The only portion of ancient records which does contain something akin to historical accounts of these regions is that which refers to Meroë, an island formed by the rivers Astaphus and Astaboras, tributaries of the Nile. There stood, from times immemorial, an oracle of Jupiter Ammon. This, and the central position of the island, together with the extraordinary fertility of its soil, the abundance of animals, metals, etc., made it not only the chief place of resort for all the inhabitants of the adjacent parts, especially the numerous nomad tribes, but also the emporium for India, Arabia, Ethiopia, Egypt, Libya, and Carthage. Thus it grew so rapidly, that about B.C. 1,000 it counted among the most powerful states of the ancient world; and about B.C. 760, having ever since Sesostri been tributary to Egypt, it succeeded, under Sabacus, in shaking off the Egyptian yoke, and continued, in his turn, to hold Egypt for about 60 years. During the reign of Psammetichus, 240,000 Egyptians settled in Meroë, which, the greater part of the immigrants being artisans, traders, etc., advanced still more. Many new cities were built, and the state was in the most flourishing condition, when it was conquered by Cambyzes, about B.C. 530. He fortified the capital town, and called it Meroë. After the destruction of Thebes by Cambyzes, most of the inhabitants of that city took refuge there, and made the country still more Egyptian. Ergamenes transformed its theocracy into a military monarchy, in the 3d c. Under Augustus, Meroë was conquered, and a Queen Candace is mentioned as his vassal. Under Nero, nothing but ruins marked the place of this once powerful and highly civilized state. Till this day, remnants of mighty buildings, covered with sculptures—representations of priestly ceremonies, battles, etc.—and half-defaced inscriptions hewn in rocks, besides rows of broken sphinxes and colossi, are frequently met with in those parts.

Their religion, art, form of government, and civilization, generally were—in their chief features at least—so identical with the Egyptian as to have given rise to the ques-

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tion, which of the two nations imparted their knowledge to the other: see EGYPT.

The history of the descendants of the ancient Ethiopians—inhabitants of the present Habesch, or Abyssinia—may be outlined as follows from their very poor and scanty native chronicles.

According to these, the son of Solomon and the Queen of Sheba (Makeda as they, Balkis as the Arabians historians call her), named Menilehek, was the first king of the Ethiopians. Few king's names occur before the time of Christ, when Bazen occupied the throne. The missionary Frumentius (330) found two brothers (Christians) reigning Abreha and Azbeha. During the time of the Greek emperor Justin (522), King Elezbass destroyed the state of the Homerites in Asia, in order to revenge their persecutions of Christians; and was canonized. From 960 to 1300, another dynasty, the Zagoean, held the chief power, all the members of the Solomonic dynasty, save one, having been murdered by Esal, who made her son king. In 1300, Ikon-Amlak, descendant of this one scion of the house of David, who had fled to Sheba, regained possession of the country, and made Sheba, instead of Axum, the seat of government. To this day, his family rules the country. Frequent revolutions within, brought about especially by the religious squabbles imported by the Portuguese toward the end of the 15th c., and a host of enemies all around—the most formidable of whom were wild nomad tribes of the desert—forced the kings more than once to apply for foreign help; among others, that of the Turks 1508; and the affairs of the modern state have at all times been anything but prosperous. Special mention is made of King Zara-Jakob (Constantine), 1434–68, who sent an embassy to the church-council at Florence; of Aznaf-Saged (Claudius), 1540–59, during whose reign Christoph. de Gama from Portugal lived in Ethiopia, and made common cause with him against his enemies. This king also wrote a confession of faith, in which he defended his church both against Jesuits and the charge of leaning toward Judaism. Socinios (1605–32) openly professed Roman views; but his son Facilides soon expelled the Jesuits and their friends from the country, and put an end to the Roman influence. Among these friends was also Abba Gregorius, later the friend of the great Ethiopologist Ludolf, who, having made his acquaintance at Rome, induced him to migrate to Gotha, where he remained until his death. Under Joas (1753–69), the Gallas, a nomad tribe, hitherto the mightiest and most dangerous enemies of the Ethiopians, not only gained admission to all the offices in the state, but acquired almost absolute power. One of them (Susul Michael), holding the place of Râsh, or prime-minister and chief-commander of the troops, proved a very great friend to Bruce, to whom he intrusted the government of a province. The several provinces remained practically independent, each chief striving to subdue his neighbors, till in 1855 the chieftain afterward known as Theodore (q.v.) attained supremacy: see also ABYSSINIA. The king resided but

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rarely in the city, and for the most part remained with his soldiers in the camp. His official name was Negus, or, in full, Negus Nagass Za-ityopja, King of the Kings of Ethiopia—alluding to the chiefs of the towns and provinces. The soldiers receive no pay, but rely on plunder; and have proved themselves able to fight bravely.

Emigrants, as were beyond doubt the earliest settlers in Ethiopia, from the other side of the Arabian isthmus, it is but natural that the structure of their language, as well as that of their own bodies, should bear traces of their Shemitic origin. The reason of this emigration is contained in the very name of this language, which is called *Geez*—free, affording the most striking parallel to the designation *Franc*—French. Free places of habitation were what they came in search of. The name Ethiopian, or, as they call it, Ithiopjawan, they adopted from the Greeks at a very late period. This their oldest language, *Leshana Geez*, was suppressed by a royal decree of Ikon-Amlak, in the 14th c., and the Amharic adopted as the court language. Ever since, the Geez has, with exception of the province of Tigré, where it is still spoken (with slight idiomatic changes), remained the *Leshana Mazhaf*, the language of books and of the church. It is exclusively used in writing, even of ordinary letters, and the educated alone understand it. Its general structure, comes as close to that of the Arabic as a dialect can and must. A great many of its words are still classical Arabic; others resemble more the Hebrew and its two Chaldee dialects, the Aramaic and Syriac; others, again, belong to African dialects; and many, as the names of the months, are Greek. It has 26 letters, 22 of which bear the ancient Shemitic stamp, and exhibit the greatest likeness to the Phœnician, the common original alphabet; and seven vowels, including a very short *e*, which sounds precisely like the Hebrew Schêwa. These vowels are represented by little hooks, and remain inseparably attached to their respective letters; and as the Geez, unlike all its sister-languages, is never written without vowels, the alphabet becomes a syllabary with 182 characters. Another difference exists in its being written from left to right—from which some have concluded that the Greeks introduced writing in Ethiopia; forgetting, in the first place, that Greek itself was frequently written from right to left, and that Zend, certain cuneiforms, hieroglyphs, etc., are likewise written from left to right. Not entering here into the grammatical minutiae of the language; we will mention that out of the ten conjugations, eight are Arabic; that there is a double infinitive, but no participle and no dual; that the formation of the so-called plural, and of declension generally, point to that very remote period when the Hebrew and Arabic made use of the same grammatical processes. There are no diacritical marks employed in writing; the letters are not combined, and the words are separated by two dots.

Although there can be no doubt of the existence of a rich literature in a flourishing country like Ethiopia anterior to Christ. still owing both to frequent internal convulsions

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and the misguided zeal of the early Christian missionaries, who here and elsewhere considered it their first duty to destroy all the ancient records of which they could lay hold, nothing but a few half-erased inscriptions have survived. The earliest existing document of post-Christian literature is a complete translation of the Bible, probably by FRUMENTIUS: see FRUMENTIUS. The Old Testament probably a translation from the Alexandrine version of the LXX., consists of four parts: 1, the Law or Octateuchos (five books of Moses, Joshua, Judges, Ruth); 2, Kings; 3, Solomon; 4, Prophets, and two books of the Maccabees. The New Testament consists of—1, Gospels; 2, Acts; 3, Paulus; 4, Apostolus. A very peculiar book, Henoch, also belongs to the literature of the Old Testament: see ENOCH. The New Testament comprises likewise another book, Senodas, containing the pseudo-Clementine or apostolical constitutions. The Ethiopians have a liturgy (*Kanan Kedaso*—Holy Kanon) and a symbolico-dogmatical work (*Haimanotu Abau*—Belief of the Fathers), containing portions of homilies of the Greek Fathers, Athanasius, Basil the Great, Chrysostom, Cyril, Gregory of Nyssa and Nazianzen. Besides these, they have martyrologies, called Synaxar. They employ in this their sacred literature a peculiar kind of rhythm without a distinct metre. Any number of rhyming lines forms a stanza, without reference to the number of words constituting the verse, or of verses constituting the stanza. They also use certain phrases as a refrain—not unlike the manner of the mediæval Hebrew Pizmon: see JEWISH LITURGY. As to general literature, they have neither a written book of laws, nor a grammar of their own language, nor, in fact, anything worth mentioning, except a *Chronicle of Axum and Chronicles of Abyssinia*. They are very fond, however, of riddles, wise saws, and the like, so fascinating to the Eastern mind. They have a Dictionary, but most of its explanations and translations are utterly wrong. No wonder the learned in Europe should have been sorely puzzled by such a language, and that they should, after long consideration, have pronounced it to be either 'Chaldee' or 'Indian,' while Bruce held it to be the language of Adam and Eve. Potgen, a Cologne church-provost, happening to be at Rome at the beginning of the 16th c., there made the acquaintance of native Ethiopians, and became the first to enlighten the world on the nature of this occult language. After him came the Carmelite Jacob Marianus Victorius from Reate, who wrote *Institutiones Linguae Chaldaee S. Aethiop* (Rome 1548), an entirely worthless book; then Wemmers, who 1683 published an Ethiopian grammar and dictionary. The principal investigator, however, is Hiob Ludolf from Gotha, who, aided by the Abba Gregorius before mentioned, and supported by his own extraordinary linguistic talents and indomitable energy, acquired such a power over this language, that notwithstanding the number of eminent Orientalists, such as Platt, Lawrence, Dorn, Flupfeld, Hoffmann, Roediger, Ewald, Isenberg, Blumen-

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bach, etc., who have since worked in this field, his books, as re-edited by Dillmann, still hold the first place. It is hardly necessary to add, that the Ethiopian is one of the most important and indispensable languages to the Shemitic scholar, containing as it does a great many words and forms of a date anterior to the separation of the different Shemitic dialects. Among the most important Ethiopian books printed in Europe are the Psalms, edited with a Latin translation by Ludolf (Frankfort 1701); the New Testament, (Rome 1548); the book of *Henoch* (Lond. 1840); *Ascensio Isaie Vatis*, with a Latin translation by Lawrence (Oxford 1819); *Didascalua*, or apostolical constitution of the Abyssinian Church (Lond. 1834).—Ludolf's works are—*Grammatica Æthiopica* (Lond. 1661; new. ed. by Dillmann 1857); *Lexicon Æthiopicum* (Frankfort 1699; new. ed. 1862); *Historia Æthiopica* (1681). Since the English expedition to Abyssinia, the British museum possesses a larger number of Ethiopic mss. than any other library.

ETHIOPIAN, n. *ē'thī-ō'pī-ăn*, or **ETHIOP**, n. *ē'thī-ōp* [Gr. *aithiōps*, sun-burnt, swarthy—from *aithēin*, to light up, to burn; *ōps*, the face, the countenance]: a native of Ethiopia. and as such supposed to be black: **ADJ.** pertaining to. **ETHIOPIA**, n. *ē'thī-ō'pī-ă*, a country of Africa, which included the modern Abyssinia and several adjacent states. **ETHIOPI'IC**, a. *-ōp'ik*, pertaining to Ethiopia or its language; applied to the negro race as inhabiting Africa.

ETHIOPS [see **ÆTHIOPS**]: term applied by the ancient chemists to oxides and the sulphides of the metals which had a dull, dingy, or black appearance. Thus, *Ethiops Martialis* was the mixture of protoxide and peroxide of iron, known as the black oxide; *Ethiops Mineral* *Ethiops* or *Narcoticus*, the black gray sulphuret of mercury procured by triturating in a mortar a mixture of mercury and sulphur; and *Ethiops per se*, was obtained by agitating commercial mercury for weeks or months, when the oxygen of the air slowly formed the black oxide of mercury.

ETHMOID, a *ēth'moyd* [Gr. *ethmos*, a sieve; *eidos*, appearance]: perforated with holes like a sieve—applied to the bone which forms the roof of the nose, which is perforated like a sieve for the passage of the olfactory nerves. It is one of the eight bones which collectively form the cavity of the cranium. It is of somewhat cubical form, and is between the two orbits of the eye, at the root of the nose. Its upper surface is perforated by a number of small openings, through which the filaments of the olfactory nerve pass downward from the interior of the skull to the seat of the sense of smell, in the upper part of the nose. It consists of a perpendicular central plate or lamella, which articulates with the vomer and with the central fibrocartilage, and thus assists in forming the septum or partition between the two nostrils. The lateral masses present a very complicated arrangement, and are so planned as to give in a small space a very large amount of surface, on which the filaments of the olfactory nerve are spread. In

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comparative anatomy we find a direct ratio between the development of these masses and the acuteness of the sense of smell. See NOSE AND THE SENSE OF SMELL. ETHMO-CRANIAL ANGLE, *eth'mo-krā'-nī-al*, in *anat.*, the angle formed by the basicranial axis with the line of the cribriform plate. The name was first given by Prof. Huxley. ETHMO-TURBINALS, n. *-tēr'bī-nalz*, in *anat.*, two lateral masses, one on each side of the central vertical plate of the ethmoid bone.

ETHNICAL, a. *ēth'nī-kāl*, or ETHNIC, a. *ēth'nīk* [Gr. *ethnikós*, pagan, heathen—from *ēthnōs*, a tribe, a nation]: relating to the different races or nations of mankind; heathen; gentile. ETH'NICALLY, ad. *-lī*. ETH'NICISM, n. *-sizm*, heathenism. ETHNOGRAPHY, n. *ēth-nōg'rā-fī* [Gr. *ethnos*, a race, a nation; *graphō*, I write]: an account or description of the origin, dispersion, connection, and characteristics of the various races of mankind. ETH'NOGRAPH'IC, a. *-nō-grāf'īk*, pertaining to the origin, dispersion, etc., of mankind; also ETH'NOGRAPH'ICAL, a. *-ī-kāl*. ETHNOG'RAPHER, n. *-nōg'rā-fēr*, one who cultivates or writes on the science of ethnography. ETHNOL'OGY, n. *-nōl'ō-jī* [Gr. *logos*, discourse]: the science of races, in all that relates to physical features, language, manners, religion, and other characteristics. ETH'NOLOG'ICAL, a. *-nō-lōj'ī-kāl*, pertaining to ethnology. ETHNOL'OGIST, n. *-nōl'ō-jīst*, one who.

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ETHNOLOGY: science that treats of the persistent modifications of the human family or group; their most marked physical, mental, and moral characteristics, when compared one with the other; their present geographical distribution on the globe; their history traced backward to the earliest attainable point; and finally, the languages of the various nations and tribes of mankind, existing or extinct, classified and compared, with the view, by their means, of determining the chief points of resemblance or dissimilarity among the nations of the earth. This science has gradually outgrown its name. It has been therefore deemed expedient to apply to it a term of wider and more neutral significance—namely, *Anthropology*—derived from the Greek, *anthropos*, man, and *logos*, a discourse. The term *Ethnology* has this inconvenience, that it means no more than the ‘science of races,’ and many authorities not only deny the existence of *races* of mankind, affirming that what are called races are in reality distinct species, but others argue that the term is as applicable to any races—e.g., races of dogs, or cats, or pigeons—as to the races of mankind. Hence the more exact and less sectarian term *Anthropology* has been applied to the science of the natural history of man. The science is divided into three branches—(1.) *Zoological Anthropology*, which treats of the relations of man to the brute creation; (2.) *Descriptive Anthropology*, or *Ethnography*, which classifies and describes the various and subdivisions of mankind, and marks out their geographical distribution; (3.) *General Anthropology*, which M. Broca calls ‘the biology of the human race,’ which, says a recent writer on the subject, ‘borrows and collates from all sciences facts and phenomena usually investigated in men as individuals, but which relate to men as groups of individuals,’ and compares these with other facts relating to other groups of individuals. The study and bare description of a single Negro’s skull is mere human anatomy; the study of a group of Negroes’ skulls, and the description and comparison of their peculiarities with those of groups of skulls belonging to other races, would be a specimen of the work done by General Anthropology.

No one can look at an Englishman, a Red Indian, and a Negro, without at once noticing the differences between the three, not only as regards the color of their skin, but the shape of the skull, the texture of the hair, and the character of the several features, as eyes, lips, nose, and cheek-bones. What strikes the ordinary observer chiefly is, of course, the difference of complexion; but the anatomist is fully as much interested in the shape of the skull. The first thoroughly scientific writer who endeavoured to lay down a method of distinguishing between the different races of mankind by a comparison of the shape and size of the skull was Peter Camper, a distinguished Dutch anatomist of last century. He laid down a technical rule for ascertaining the *facial line*, and determining the amount of the *facial angle*, which he has thus described: ‘The basis on which the distinction of nations is founded may be displayed by two straight lines, one of which is to be drawn

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through the *mentus anterior* to the base of the nose, and the other touching the prominent centre of the forehead, and falling thence on the most advancing part of the upper jaw-bone, the head being viewed in profile. In the angle produced by these two lines may be said to consist not only the distinctions between the skulls of the several species of animals, but also those which are found to exist between different nations. The heads of birds display the smallest angle, and it apparently becomes of greater extent 'in proportion as the animal approaches more nearly to the human figure. Thus, there is one species of the ape-tribe in which the head has a facial angle of 42 degrees; in another animal of the same family, which is one of those *Simiæ* most approximating in figure to mankind, the facial angle contains exactly 50 degrees. Next to this is the head of the African Negro, which, as well as that of the Kalmuk, forms an angle of 70 degrees; while the angle discovered in the heads of Europeans contains 80 degrees. On this difference of 10 degrees in the facial angle, the superior beauty of the European depends; while that high character of sublime beauty which is so striking in some works of ancient statuary, as in the head of Apollo, and in the Medusa of Sisocles, is given by an angle which amounts to 100 degrees. The nearer the facial angle approached a right angle, the greater was held to be the intellectual development of the race. But M. Jacquart, of the Natural History Museum in Paris, showed that the facial angle in stupid people very often approached closely a right angle, and that, in the homogeneous population of Paris, the facial angle varied within wider limits than those that Camper stated as a criterion of distinct species.

Camper's method was abandoned for the vertical method, or *norma verticalis*, invented by Blumenbach. The object being to collect the greatest number of characteristics—'The best way,' says Blumenbach, 'of obtaining this end is to place a series of skulls with the cheek-bones on the same horizontal line resting on the lower jaws; and then viewing them from behind, and fixing the eye on the vertex of each, to mark all the varieties in the shape of parts that contribute most to the national character, whether they consist in the direction of the maxillary and malar bones, in the breadth or narrowness of the oval figure presented by the vertex, or in the flattened or vaulted form of the frontal bone.' Founding upon this mode of admeasurement applied to a large collection of skulls of different nations, accumulated by himself, Blumenbach classified the human family into the following five varieties—viz., the Caucasian, Mongolian, Ethiopian, Malay, and American. In the first of these—which he made to include the Caucasians or Circassians Proper, the Celts, the Teutons, the Shemites, the Libyan family, the Nilotic family, and the Hindustanic family—the skull is large and oval, the forehead expanded, the nasal bones arched, the chin full, and the teeth vertical. In the second—which embraces the Chinese and Indo Chinese, the natives of the polar regions, the Mongol Tartars, and the Turks—the skull is oblong,

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but flattened at the sides, the forehead low and receding, the nose broad and short, and the cheek-bones broad and flat, with salient zygomatic arches. In the third—embracing the Negroes, Kafirs, Hottentots, Australians, Alforians and Oceanic Negroes—the skull is long and narrow, the forehead low, the nose broad and flat, the cheek-bones prominent, the jaws projecting like a muzzle, the lips thick, and the chin small. In the fourth—embracing the Malays and Polynesians generally—the skull is high and square, the forehead low, the nose short and broad, and the jaws projecting. In the fifth—embracing the American Indian family and the Toltican family—the skull is small, with the apex high, and the back part flat, the forehead receding, the cheek-bones high, the nose aquiline, the mouth large, and the lips tumid.

This classification of the human family, with the added characteristics under each class, of complexion, hair, and eyes is, upon the whole, the most popular, having been elaborated, and presented to the world by Blumenbach in a form acceptable to scientific inquirers. Later researches, however, have proved it not quite tenable. Thus, Cuvier reduced the five classes of Blumenbach to three—viz., the Caucasian, Mongolian, and Ethiopian, treating the Malay and American as subdivisions of the Mongolian. Jacquinot does the same. Dr. Prichard, who brought to the study of ethnology not only a large acquaintance with physiology, but considerable knowledge of languages, admits a greater number of varieties than Blumenbach; but divides his Caucasian class into two independent groups, which he calls the Syro-Arabian or Semitic, and the Aryan or Indo-Germanic. Moreover, he objects to the term Caucasian, as representing the notion that mankind had their origin on mountain heights. For himself, Prichard holds with the view that it was rather on the banks of large rivers and their estuaries that the primitive nations developed themselves. 'The cradles or nurseries of the first nations, of those at least who became populous, and have left a name celebrated in later times, appear to have been extensive plains or valleys, traversed by navigable channels, and irrigated by perennial and fertilizing streams. Three such regions were the scenes of the earliest civilization of the human race, of the first foundation of cities, of the earliest political institutions, and of the invention of the arts which embellish human life. In one or these, the Semitic or Syro-Arabian nations exchanged the simple habits of wandering shepherds for the splendor and luxury of Nineveh and Babylon. In a second, the Indo-European or Japetic people brought to perfection the most elaborate of human dialects, destined to become in after-times, and under different modifications, the mother-tongue of the nations of Europe. In a third, the land of Ham, watered by the Nile, were invented hieroglyphical literature, and the arts in which Egypt far surpassed all the rest of the world in the earlier ages of history.' Dr. Prichard, in his well-known *Natural History of Man*, commences with a description of these three divisions of the human race, not as dis-

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criminated one from the other by the form of the skull, but as comprising nearly all the civilized communities, and indeed most of the tribes of people known to antiquity. 'They were neither nomades nor savages, nor do they display in their crania either of the forms principally belonging to races in those different states of existence. They had all heads of an oval or elliptico-spherical form, which are observed to prevail chiefly among nations who have their faculties developed by civilization.' As they cannot, however, by any means be made to comprehend all the types of man, after the Egyptians, he describes the great body of the nations of Africa, embracing tribes sunk in the lowest state of degradation; and after the Aryans, or Indo Europeans, the people of high Asia, chiefly Nomades, inhabiting vast steppes, and never rising in the scale of civilization beyond the condition of wandering shepherds, though in this capacity possessing some wealth, and acquainted with the use of clothing, tents, and wagons. 'These classes of nations,' he observes, 'have different physical characters. Among the African savages we find the *prognathous* form of the head and all its accompaniments; and these traits display themselves in proportion to the moral and physical degradation of the race. In northern Asia, most of the inhabitants have the pyramidal and broad-faced skulls. See ARYAN RACE: EGYPT: SHEMITIC NATIONS.

Of one of these three grand divisions of the human race, the Aryan, Dr. Prichard gives the following subdivision. The great Aryan or Indo-European race, which extends itself from the mouth of the Ganges to the British Islands and the northern extremities of Scandinavia, and now through a great extent of the American continent, divides itself, according to Prichard, into two branches—viz., the parent stock in Asia, and the colonies that it successively sent forth into Europe. The Asian branch comprises: 1. Hindus; 2. Persians; 3. Afghans; 4. Baluchi and Brahui; 5. Khurds; 6. Armenians; and 7. Ossetimes. The collective body of the European nations are now generally regarded as a series of colonies from Asia. The proof turns mainly on a comparison of languages; the ancient Sanscrit being regarded by the most competent judges as the parent, not only of the Greek and Latin languages, but of the Teutonic, with its several ramifications of the Slavonic, Lettish, Lithuanian, and even Celtic. Dr. Prichard himself was the first to point out the affinity of the Celtic with the Sanscrit, Greek, Latin, and Teutonic, in a memoir published 1831, on the *Eastern Origin of the Celtic Nations*. Later philologists have confirmed the view taken by him, and he is perhaps correct also in the conclusion, that they were the first great immigration of the Aryans into Europe, who were afterward conquered, and their numbers considerably reduced by fresh advancing colonies from the same parent hive. But there are other nations or tribes of Europe which no efforts of the philologists have succeeded in tracing to the Aryan stock; such are the Lapps, Finns, Tschudes, and Ugrians of the north, and the Euskaldunes, now principally represented by the Basques in the west.

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To these Dr. Prichard has given the appellation of Allophylian. [Gr. *allos*, another, and *phyle*, tribe], thereby signifying their independence of the Aryan stock. The progenitors of these tribes were probably the inhabitants of Europe, prior to the first Aryan immigration.

After these several races, Dr. Prichard treats of the native tribes of the austral seas and the great Southern Ocean, and finally, of the native inhabitants of America. In every case, he carefully describes the physical appearance or structure, the geographical *habitat*, history, and migrations (if any), the language, and the moral and physical attributes of the nation or tribe, brought immediately under notice. His information has generally been obtained from the best sources, hence his works may be regarded as a storehouse of knowledge upon ethnology.

But both before and since Blumenbach and Prichard, there have been several classifications of the human race proposed, the simplest of which is perhaps that of Dr. Latham, into 1. Mongolidæ; 2. Atlantidæ; 3. Japetidæ. This writer was long properly regarded as the chief exponent of the science of E. in Britain. Following in the track of Prichard, and possessing, like him, a considerable acquaintance with physiology and history, he altogether surpasses him in the department of comparative philology. His contributions to the science of E., borrowed from this particular branch of study, are consequently of the highest value. But there is one important question, with respect to which the suffrages of the best philologists are rather with Prichard than with Latham—viz., the origin of the Aryan or Indo-European race. Prichard, as we have seen, refers it to Asia, while Latham claims it for Europe.

Retzius's classification is based on the idea that the psychical individuality of a race is expressed by brain-development as indicated by the shape of the skull. He divides races into—I. Dolichocephalic, or long-skulled races, where the length of the skull is due to a lengthening of the posterior lobes of the brain; and II. Brachycephalic, or short, broad-skulled races, in whom the comparative shortness of these lobes causes them to be more developed in breadth. These are subdivided, according to the form of the face, into (1) Orthognathous, or straight-faced peoples, e.g., Europeans; and (2) Prognathous, or races with projecting jaws, e.g., Negroes. This classification laid the foundation of ethnographic craniology. Zeune divides mankind into—(1) Races with high skulls, e.g., Indo-Europeans; (2) Races with broad skulls, e.g., Mongols and some Malay tribes; (3) Races with long skulls e.g., Negroes. Such classifications err in grouping under the same divisions races between which it is otherwise impossible to establish any consanguinity. Passing over the wild speculative classifications of the modern German materialistic school, a specimen of which is that of Carl Vogt (who, assuming the ape origin of mankind to be an indubitable fact, describes three great divisions of the human race in correspondence with the three species of anthropomorphic apes found in Asia, Africa, and America),

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the only other very recent classification with pretensions to scientific reasonableness, is that of Prof. Huxley, founded on the hair as a race-character. He describes two primary divisions—I. Ulotrichi, crisp or woolly-haired people, with skulls longer than they are broad (Dolichocephalic), and with the skin-color varying from yellow to black: Negroes, Bushmen, and Malays are sub-divisions of this great group. II. Leiotrichi, or smooth-haired people, subdivided into (1) the Australoid group, with 'dark eyes, wavy black hair, and eminently long, prognathous skulls, with well-developed brow ridges;' (2) The Mongoloid group, e.g., Chinese, Tatars, Polynesians, and American aborigines; (3) The Xanthochroic group, fair, blue-eyed people, e.g., Slavs, Teutons, Scandinavians, and fair, Celtic-speaking nations; (4) The Melanochroic group, or pale-skinned people, with dark hair and eyes, e.g., the Iberians, or 'black Celts' of Europe, the inhabitants of the Mediterranean coast and of w. Asia—a group resulting probably from intermixture of the Australoid and Xanthochroic races. Under the Australoid group is classed such apparently unrelated races as the Australians, the Dekhan tribes in India, and the ancient Egyptians; and curiously enough, Colonel Lane Fox has since shown that, from resemblances in the weapons, implements, etc., in use among these very races, Prof. Huxley's apparently startling views as to their affinity are not improbable.

A more important question is, what do classifications classify—species or varieties? Prichard held that mankind sprang from one stock, and constituted one species. Existing diversities in form and physique in races he accounted for by the influence of food, climate, and other circumstances, operating through a long series of years. Mr. Darwin's recent work on *Animals and Plants under Domestication* powerfully corroborates this view, for it demonstrates that within the limits of one admitted species of animal there may be produced—as he claims, by the operation merely of artificial selection and hereditary transmission of peculiarities—diversities infinitely greater than those existing between the highest and lowest races of mankind. Then, again, the highest and lowest human races interbreed, and their offspring is fertile, which would hardly be the case if the parents were of different species. Some have held that the difficulties of migration from an original centre of creation were too great to be compatible with the wide geographical distribution of mankind. Yet even the South Sea Islanders—and in their case the difficulties alluded to must have been greater than in most others—may have come to their present abodes by migration; for Japanese mariners have sometimes by stress of weather been driven from their course, and cast on the shores of islands in the South Seas. This doctrine of monogeny, or original unity of the human race, is supported by Dr. Latham with arguments from philology. Dr. Latham, taking it as a matter of fact that all the languages of mankind have had a common origin, argues from it in favor of an original unity of race. This common origin of lan-

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guage, however, is a thing by no means proved. 'The idea of an original language of the whole human race,' says Dr. Waitz (*Introduct. Anthropologie Naturvölker*), 'is by science now regarded as a chimera.' Admitting that Klaproth, Fürst, and Delitzsch have taken great pains to establish an affinity between the Sanskrit and the Hebrew, M. Renan and other excellent authorities regard the attempt as unsuccessful, and, even were it otherwise, 'the Chinese,' says a late writer (Farrar, *Essay on the Origin of Language*), 'must always remain a stumbling-block in the way of all theories respecting a primitive language. Radical as is the dissimilarity between Aryan and Semitic languages, and wide as is the abyss between their grammatical systems, yet they almost appear like sisters when compared with the Chinese, which has nothing like the organic principle of grammar at all. Indeed, so wide is the difference between Chinese and Sanscrit, that the richness of human intelligence in the formation of language receives no more striking illustration than the fact, that these languages have absolutely *nothing* in common except the end at which they aim. This end is in both cases the expression of thought, and it is attained as well in Chinese as in the grammatical languages, although the means are wholly different.'

The American school of E. hold views and conclusions totally different from those of Drs. Prichard and Latham. This school was founded by the late Dr. Morton of Philadelphia, an erudite and active man of science, who labored many years in forming a collection of human crania of all nations, and of ancient as well as modern ages, with the design of still further carrying out Blumenbach's researches into the varieties of mankind by a comparison of crania, according to the method proposed by him. This collection of crania was begun 1830, and at the time of Morton's death 1851, amounted to the large number of 918 human crania, to which were afterward added 51; and it included also 278 crania of mammals, 271 of birds, and 88 of reptiles—in all, 1606 skulls,—the largest collection of the kind ever formed, and which, fortunately for science, is now deposited in the Museum of the Acad. of Nat. Sciences at Philadelphia. Simultaneously with this accumulation of crania, Dr. Morton carried on his researches in E., not, however, in the restricted sense in which he began, following Blumenbach's classification, but availing himself of the latest discoveries of Prichard, and the other English and continental writers. One of the results of his labors was the publication, 1839, of a handsome work, entitled *Crania Americana*, which was followed 1844 by the *Crania Aegyptiaca*, in the collection of which he had been much aided by Mr. G. R. Gliddon. 'In this work,' says his biographer, Dr. Patterson, 'Morton found himself compelled to differ in opinion from the majority of scholars, in regard to certain points of primary importance.' The great question of the unity or diversity of mankind in their origin was one that early forced itself upon his attention, and the conclusion at which he arrived, after

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much patient investigation, was in favor of the latter view. He was slow to publish any opinion on the subject, probably reserving it for a work upon which he was engaged, to be entitled *Elements of Ethnology*. His opinion, however, was well known to his friends. In a note to a paper in *Silliman's Journal* 1847, he says: 'I may here observe that whenever I have ventured an opinion on this question, it has been in favor of the doctrine of primeval diversities among men; an original adaptation of the several races to those varied circumstances of climate and locality which, while congenial to the one, are destructive to the other; and subsequent investigations have confirmed me in these views.' In a letter to Dr. Nott, dated 1850, Jan., he lays down the following proposition: 'That our species had its origin, not in one, but in several or in many creations, and that these diverging from their primitive centres, met and amalgamated in the progress of time, and have thus given rise to those intermediate links of organization which now connect the extremes together. Here is the truth divested of mystery; a system that explains the otherwise unintelligible phenomena so remarkably stamped on the races of men.' His latest utterance upon the subject is contained in a letter written to Mr. G. R. Gliddon, 1851, Apr., only a fortnight before the writer's decease, which concludes as follows: 'The doctrine of the original diversity of mankind unfolds itself to me more and more with the distinctness of revelation.' His views upon this and other points of dispute among ethnologists have been since embodied in a remarkable work, entitled *Types of Mankind; or, Ethnological Researches based upon the Ancient Monuments, Paintings, Sculptures, and Crania of Races, and upon their Natural, Geographical, Philological, and Biblical History: illustrated by Selections from the inedited Papers of S. G. Morton, M. D., and by additional Contributions from Professor L. Agassiz, W. Usher, M. D., and Professor H. S. Patterson. By J. C. Nott, M. D., and G. R. Gliddon (Philadelphia 1854)*. In this composite work, perhaps the most remarkable feature is the paper contributed by the celebrated naturalist, Prof. Agassiz, in support of Dr. Morton's theory as to the original diversity of the human races.

The paper by Agassiz is entitled, *Sketch of the Natural Provinces of the Animal World, and their Relation to the Different Types of Man*. It was drawn up by the writer from a conviction that much might be gained in the study of ethnography by observing the natural relations between the different races of man and the plants and animals inhabiting the same regions. The sketch given by him is intended to show, that 'the boundaries within which the different natural combinations of animals are known to be circumscribed upon the surface of our earth coincide with the natural range of distinct types of man. Such natural combinations of animals circumscribed within definite boundaries are called *Faunæ*, whatever be their home—land, sea, or water.' There are eight regions of the earth, according to Agassiz, each containing its own *faunæ*, and its own peculiar type of man; and his main conclusion

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from a consideration of these several faunæ is as follows: 'That the diversity among animals is a fact determined by the will of the Creator, and their geographical distribution part of the general plan which unites all organized beings into one great organic conception; whence it follows that what are called human races, down to their specialization as nations, are distinct primordial forms of the type of man.' Messrs. Nott and Gliddon, in their work quoted, appeal triumphantly to this theory of Agassiz in support of their view as to the primitive diversity of the races of mankind; and in a subsequent work, *Indigenous Races of the Earth* (Philadelphia 1857), have inserted a further communication from the writer, in which, while he reiterates his formerly expressed opinion, that the races of man, so far as concerns their geographical distribution, are subject to the same circumscription as the other members of the animal kingdom, he observes: 'Even if this fact stood isolated, it would show how intimately the plan of the animal creation is linked with that of mankind. But this is not all. There are other features, occurring among animals, which require the most careful consideration, inasmuch as they bear precisely upon the question at issue, whether mankind originated from one stock or from several stocks, or by nations. These features, well known to every zoologist, have led to as conflicting views respecting the unity or plurality of certain types of animals as are prevailing respecting the unity or plurality of the origin of the human races. The controversy which has been carried on among zoologists upon this point, shows that the difficulties respecting the races of men are not peculiar to the question of man, but involve the investigation of the whole animal kingdom—though, strange as it may appear, they have always been considered without the least reference to one another.'

This theory of Agassiz, it must be stated, is very generally controverted, as likewise the opinions generally of Dr. Morton and the American school of ethnology, partly on Biblical, but chiefly on scientific grounds. Indeed, from the conflict of opinions as to the origin of the human race, if the solution of this question were the sole object of anthropology, the science might be said to be in a very unsatisfactory state. But this is not the case. The question at issue is one that may well be left in abeyance for the present. Without it, the field of inquiry is sufficiently wide, and is well cultivated by skilled laborers, who continually bring the product of their researches in physiology, geography, archæology, and comparative philology to enrich and fructify the newly turned-up soil.

Subjoined is the classification of Dr. Latham (to which Prof. Huxley's—above given—is now generally preferred):

I. MONGOLIDÆ.

Physical Characteristics.—Face broad and flat; frontal profile retiring or depressed; maxillary profile moderately prognathic or projecting, rarely orthognathic; eyes often oblique; skin rarely a true white, rarely a jet-black; irides

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generally dark; hair straight, and lank, and black, rarely light-colored, sometimes curly, rarely woolly. *Languages*—aptotic and agglutinate, rarely with a true amalgamate inflection: see LANGUAGE. *Distribution*—Asia, Polynesia, America. *Influence upon the history of the world*, material rather than moral.

A. ALTAIC MONGOLIDÆ.—1. *Seriform stock*, embracing Chinese, Tibetans, Anamese, Siamese, Kambojians, Burmese, the Môn, and numerous unplaced tribes. 2. *Turanian stock*, embracing the Mongolian branch, the Tungusian branch, the Turk branch, and the Ugrian branch.

B. DIOSCURIAN MONGOLIDÆ.—1. Georgians. 2. Lesgi-ans. 3. Mizjeji. 4. Irôn. 5. Circassians.

C. OCEANIC MONGOLIDÆ.—1. *Amphinesian stock*, embracing ProtoneSIans, Polynesians, Malegasi (?). 2. *Kelanonesian stock*, embracing the natives of New Guinea, New Ireland, Solomon's Isles, Louisade, New Caledonia, Australia, and Tasmania.

D. HYPERBOREAN MONGOLIDÆ.—1. Samœids. 2. Yeniseians. 3. Yukahiri.

E. PENINSULAR MONGOLIDÆ.—1. Koreans.—2. Japanese. 3. The Aino. 4. Koriaks. 5. Kamskadales.

F. AMERICAN MONGOLIDÆ.—Embracing the various native tribes of N. and S. America.

G. INDIAN MONGOLIDÆ.—1. Tamul. 2. Pulinda. 3. Brahui. 4. Indo-Gangetic. 5. Purbutti. 6. Cashmirian. 7. Cingalese. 8. Maldivian.

II. ATLANTIDÆ.

Physical Characteristics.—Maxillary profile projecting; nasal, generally flat; frontal, retiring; cranium, dolikhokephalic; the parietal diameter generally narrow; eyes rarely oblique; skin often jet-black, very rarely approaching a pure white; hair crisp, woolly, rarely straight, still more rarely light-colored. *Languages*, with an agglutinate, rarely an amalgamate inflection. *Distribution*, Africa. *Influence on the history of the world*, inconsiderable.

A. NEGRO ATLANTIDÆ.—Various negro tribes.

B. KAFIR ATLANTIDÆ.—Kafir tribes, etc.

C. HOTTENTOT ATLANTIDÆ.—1. Hottentots. 2. Saabs. 3. Dammaras.

D. NILOTIC ATLANTIDÆ.—1. Gallas. 2. Agows and Falasha. 3. Nubians. 4. Bishari. 5. M'Kuafi, etc.

E. AMAZIRGH ATLANTIDÆ.

F. EGYPTIAN ATLANTIDÆ.

G. SEMITIC ATLANTIDÆ.—1. Syrians. 2. Assyrians. 3. Babylonians. 4. Beni Terah (Edomites, Jews, Samaritans, etc.). 5. Arabs. 6. Ethiopians. 7. Canaanites, etc.

III. JAPETIDÆ.

Physical Characteristics.—Maxillary profile but little projecting; nasal often prominent; frontal sometimes nearly vertical; face rarely very flat, moderately broad; skull generally dolikhokephalic; eyes rarely oblique; skin white or brunette; hair never woolly, often light-colored; irides black, blue, gray. *Languages*, with amalgamate inflections, or else anaptotic: rarely agglutinate, never aptotic.

ETHOLOGY—ETHYL.

Distribution, Europe. *Influence on the history of the world*, greater than that of either the Mongolidæ or the Atlantidæ, moral as well as material.

A. OCCIDENTAL JAPETIDÆ.—Kelts.

B. INDO-GERMANIC JAPETIDÆ.—I. *European class*, embracing Goths, Teutons (Mæso-Goths, High and Low Germans, Franks), Scandinavians, Sarmatians, Slavonians (Russians, Servians, Illyrians, Bohemians, Poles, Serbs), Mediterranean Indo-Germans (Hellenic branch, Italian branch. 2. *Iranian class*, embracing Persians, Kurds, Beluchi, Patans (Afghans), Tajiks, Siaposh, Lugmani, Dardoh, Wokhan. 3. *Unplaced stocks*, Armenians, Iberians-Albanians. 4. *Extinct stocks*, Pelasgi, Etruscans, popular tions of Asia Minor.

ETHOLOGY, n. *ěth-öl'ō-jě* [Gr. *ěthos*, use, disposition, or character formed by habit; *logos*, discourse]: the science which determines the kind of character produced in conformity to certain general laws, or by any set of circumstances, physical and moral; the theory of the causes which determine the type of character belonging to a people, or to an age. ETHOLOGICAL, a. *ěth'ō-lěj'ī-k'ul*, connected with or relating to ethology. ETHOLOGIST, n. *-jist*, one versed in ETHOLOGY.

ETHULIA, n. *ě-thū'li-a* [etym. doubtful]: in bot., typical genus of the sub-tribe *Ethuliæ*.

ETHUSA, n. *ě-thū'za* [Gr. *ăthussō*, I put in rapid motion; I kindle]: genus of brachyurous short-tailed crustaceans: example, *Ethusa mascarone*.

ETHYL, n. *ěth'il* [from *ether*, and Gr. *ălē*, the matter from which a thing is made], (symbol C_4H_6): the organic radical contained in ether and alcohol—the starting point of the family group, of which ordinary ether and alcohol are members.

Ethyl, C_4H_6 .

Ether, C_4H_6O , Oxide of Ethyl.

Alcohol, C_4H_6O,HO , Hydrated Oxide of Ethyl.

It may be prepared by acting upon iodide of ethyl by granulated zinc, when the ethyl is liberated, and may be obtained as a colorless, inflammable gas, of an agreeable odor, insoluble in water, but soluble in alcohol. ETHYLIC, a *ěth-il'ik*, connected with ethyl. ETHYLAMINE, n. *-ă-mîn* [*ethyl* and *amine*]: substance strongly resembling ordinary ammonia or hartshorn in odor and other properties. It is found in coal-tar, in the oil obtained during the destructive distillation of bones, in the gases evolved during putrefaction, and may be produced by certain complicated chemical processes. Ethylamine is a mobile, transparent, colorless liquid of specific gravity 696 (water = 1,000), and boils at 66° F. It has a strong ammoniacal odor, has an alkaline action with coloring matters, forms white fumes with strong acids, and in composition is analogous to gaseous ammonia (NH_3 or $NHIII$), with one of the atoms of hydrogen replaced by ethyl (C_4H_6O or Ae), and is represented by the symbol $NHHAe$ or NH_2Ae . ETHYLENE, n. *ěth'ě-lēn*: see ETHENE OLEFIANT GAS. ETHYLIDENE, n.

ETIENNE—ETIOTIN.

i-dène, unsymmetrical hydrocarbon dyad radical. It is isomeric with the symmetrical dyad radical ethylene.

ETIENNE, *St. sǎngt ā-tē-ě'n'*: important manufacturing town of France, dept. of Loire; on both banks of the Furens, an affluent of the Loire, in the centre of a valuable and extensive coal-field, 30 m. s.s.w. of Lyon by rail, about 288 m. s.s.e. of Paris. It is surrounded by coal-mines, is seated upon coal-deposits, and has galleries driven even beneath its streets. The stream on which the town is built furnishes invaluable water-power to move its machinery, and its waters are also of great use for tempering iron and steel. The old town of St. E. is badly built, and the new town, which has sprung up very quickly, is destitute of architectural harmony. The newer houses are built of a fine white sandstone, and are frequently five and six stories in height; but they rapidly become tarnished and begrimed by the perpetual cloud of coal-smoke which hangs over the town. The most note-worthy building is the Hôtel-de-Ville, which contains the *Musée Industriel*, with specimens of the manufactures of the town, and of the minerals and fossils of the neighborhood. St. E. is famous for manufactures of ribbons and firearms. The ribbon manufactories contain 30,000 looms, and the annual value of their produce is estimated at 60,000,000 francs (\$11,518,750) in value. They are unrivalled in elegance of design, and in richness and delicacy of color, and are exported to all parts of the world. There are extensive private manufactories of firearms besides an imperial firearms manufactory, which supplies most of the muskets of the French army. St. E. has also extensive manufactures of bayonets, scythes, nails saw-blades, foils, anvils, vices, files; also of silks, velvets, lace, embroidery, muslins, glass, leather, and paper. From the coal-field on which St. E. is situated, about 600,000 tons of coal are raised annually. On 1866, Jan. 1, St. E. was constituted cap. of the dept. St. E. arose originally from a castle built in the 10th c. by the Counts of Forez. It increased greatly in the 15th c. Pop. (1771) 20,000; (1851) 49,614; (1872) 80,526; (1876) 117,537; (1891) 133,443.

ETIOLATE, *v. ē'tī-ō-lāt'* [*F. étioier*, in gardening, to grow up long-shanked and colorless]: to whiten by excluding the light of the sun; to blanch; to become white. E'TIOLATING, *imp.* E'TIOLATED, *pp.*: *ADJ.* applied to the whitening of the leaves and the lengthening of the stem of a plant by its being suffered to grow in a shady or dark situation. E'TIOLATION, *n. -lū'shūn*, the act of becoming white by the absence of light; absence of green color, the process of blanching plants by excluding the action of light.

ETIOLOGY, or ÆTIOLOGY, *n. ē'tī-ōl'ō-jī* [*F. étologie*—from Gr. *aitia*, a cause; *logos*, a discourse]: the doctrine of causes, particularly with reference to diseases; the science of the origin and development of things. E'TIOLOG'ICAL, *a. -līj'ī-kāl*, connected with or related to etiology.

ETIOTIN, *n. ē'tī-o-tīn.*: in *chem.*, yellow coloring matter, found in plants which have grown in the dark.

ETIQUETTE—ETNA.

ETIQUETTE, n. *ët'î-kèt'* [F. *étiquette*, a ticket on which the forms to be observed on particular occasions were inscribed]: forms of civility, manners or good breeding; the ceremonial code of polite society. Originally, etiquette signified a little piece of paper affixed to a bag or other object to signify its contents. The word came probably to possess the secondary meaning which we now attach to it, of the forms or decorums observed in the intercourse of life, particularly on state occasions, from its having been customary to deliver such tickets, instructing each person who was to take part in the ceremony as to the part which he was expected to take. The cards which are still delivered to the mourners at funerals, and those on which the order of the dances is set forth at balls and evening parties, are of this nature.

ETIVE, *ët'iv*: sea-loch in the n. of Argyleshire, Scotland, extending inland from the Firth of Lorn, 20 m. e. and n.e., with a breadth of a quarter of a mile to three m. It is bordered by granite in its upper part, and by trap in its lower. Near its mouth, there is mica-slate on the n. side, and Permian strata on the south. The river Awe, the outlet of Loch Awe, falls into the loch at the bend, where also is the ferry of Bunawe, and the small river Etive falls into it at its n.e. end. The loch abounds in seals, salmon, porpoises, and cod. The scenery around the upper half of the loch is grand and romantic. To the e. rise Ben Cruachan, 3,670 ft. and Ben Starive, 2,500 ft. and to the n. is Ben. Mahr-gage. The loch admits small coasting-vessels. Ardhattan Priory, founded in the 13th c., on the site of a monastery of the 6th or 7th c., is now in ruins. Connel Ferry, in the lower part of the loch, near a vitrified fort, is only 680 ft. broad, and is a very turbulent cataract, three or four ft. high at half-tide, caused by a sunken reef of rocks, partly bare at low water. At the s. side of the mouth of Loch E., three m. n. of Oban, on a projecting conglomerate rock 10 to 30 ft. high, are the ruins of Dunstaffnage Castle, the ancient stronghold of the Macdougals, a building in what is called the Edwardian style of the end of the 13th or beginning of the 14th c., with walls 400 ft. in circumference, 30 to 50 ft. high, and 10 ft. thick, and with three round towers. Dunstaffnage is supposed by some to have been the seat of the Dalriadic Scottish monarchy (see DALRIADA), and from this place the famous slab or Stone of Destiny (Lia Fail), now in the coronation-chair, Westminster Abbey, is said to have been taken 843 by Kenneth Macalpine to Scone, whence Edward I. removed it to London.

ETNA, n. *ët'nâ* [after the volcano *Etna*]: a familiar name for a water-boiler heated by spirit.

ETNA, or **ÆTNA**, *ët'nâ* (now MONTE GIBELLO). largest volcano in Europe. It is an isolated mountain, on the coast of Sicily, and cut off from the chain of mountains parallel with the n. shore of the island, by a small valley through which flows the Alcantara, and from the s. chain by a larger valley, which forms the basin of the Giaretta. Its e. side rises directly from the Mediterranean, 30 m. of

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coast being formed by the streams of its lavas. Its base is almost 90 m. in circumference, and from this it rises like an immense cone to the height of 10,874 feet.

The history of E. does not carry us far back geologically; an active volcano in the later portion of the Tertiary period, it continues still to pour forth materials; and the ejected ashes, dust, and lapilli, together with the streams of molten lava, have, in the course of untold ages, built up this immense mountain. One central crater has been the prevailing outlet for these materials, and they have consequently arranged themselves into one central and dominant mound—the cone shaped E.; but innumerable secondary and surrounding craters, each forming, by its ejected matter, an external smaller cone, exist on Etna. Many of these, in the increase of the mountain, have been covered and hid by the more recent eruptions. Eighty of them may be counted surrounding the upper portion of E., many being hills of considerable altitude, but all appearing only as trifling irregularities



Distant View of Etna.

when viewed at a distance as subordinate points of so colossal a mountain. Seen from the summit, they present a beautiful aspect; some bare and barren, others covered with the dark and sombre pine, or with the gayer and more varied foliage of the oak, the beech, and the hawthorn, and all arranged in picturesque groups of various heights and sizes. But the most remarkable feature in E. is the Val del Bove, an immense gully excavating the eastern flank of the mountain, five m. across, and surrounded by nearly vertical precipices 1,000 to 5,000 ft. high, on which are shown sections of innumerable lava-streams and beds of scorix, traversed by highly inclined dikes. It has a singularly dreary and blasted appearance.

The summit of E. rises considerably above the line of vegetation, and consequently presents, except where covered with snow, a dreary waste of black lava, scorix, and ashes, in the centre of which, in a desolate plain, rises the crater-bearing cone. This is called the Desert region. It is followed by six or seven m. of the Woody region, in which

ETOLIA—ETON COLLEGE.

luxuriant forests of pine, oak, beech, poplar, and hawthorn abound, with rich pasturage for herds and flocks. A varying breadth of from two to eleven m. of cultivated region surrounds the base of Etna. Its great products are corn, oil, wine, fruit, and aromatic herbs.

The first recorded eruption of E. took place B.C. 476. The most remarkable that have occurred since are the following: A.D. 1169, when Catania and 15,000 of its inhabitants were destroyed; 1527, in which two villages and many human beings perished; the eruption which continued at intervals 1664-73, and destroyed many villages with their inhabitants. Numerous chasms were formed at this time; from one several miles long and four or five ft. wide were emitted a bright light and strong sulphurous vapor; from another, black smoke and quantities of stones were given out; and from others, streams of lava. In 1673, an immense volume of salt (?) water rushed down the mountain: by some, it is supposed to have been ejected from the crater, but it is more probable that it arose from the sudden melting of the snows which covered the summit of the mountain. A very great eruption took place 1852. Immense clouds of ash-gray dust were ejected. From two new mouths on the eastern flank there issued vast torrents of lava, one of which was two m. broad, and at one time as much as 170 ft. deep. The next outbreak, 1864-5, was not important. That of 1879, May, was much more violent; the clouds of smoke and showers of ashes and scorïæ being followed by the ejection of a torrent of lava 200 to 300 ft. in width which desolated a large tract of highly cultivated land.

The minerals peculiar to volcanic rocks occur at E., such as chrysolite, zeolite, selenite, alum, nitre, vitriol, copper, mercury, and spicular iron.

ETOLIA: see *ÆTOLIA*.

ETON, *ē'ton*: town in the s. of Buckinghamshire, England, on the left bank of the Thames, 42 m. s.s.e. of Buckingham 22 m. w.s.w. of London, near the Slough station of the Great Western railway. It lies opposite to Windsor, in Berkshire, with which it is connected by bridge over the Thames. Though in separate counties, these two towns really form one. E. consists chiefly of one long well-paved street, and is mainly dependent on the college. Pop., exclusive of the Eton boys, (1881) 3,466; (1891) 2,499.

ETON COLLEGE: one of the most famous educational establishments in England; founded 1440 by Henry VI., under the title of 'The College of the Blessed Mary of Eton beside Windsor.' The original foundation consisted of a provost, 10 priests, 4 clerks, 6 choristers, 25 poor grammar scholars, a master, and 25 poor infirm men. The king provided for the establishment out of his own demesne lands and the estates of certain alien priories. A supplementary charter was granted 1441, in which year also the college buildings were commenced. Henry was very solicitous that the work should be of a durable kind. Some of the buildings were finished 1443, and were transferred by the royal commissioners to the provost, clerk, and scholars.

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Political troubles of various kinds retarded the completion of the buildings till 1523. Bp. Waynflete was the first head-master, and afterward a munificent supporter of the college. The institution passed through much peril in the reign of Edward IV., and again in the time of the Commonwealth; but it surmounted the dangers, and the increasing value of its estates brought in a large income.

The original foundation has been greatly modified under the Public Schools Act, 1868. It now consists of a provost and 10 fellows, who constitute the 'governing body,' 2 chaplains or conducts, and 70 scholars. The members of the governing body are nominated by the universities of Oxford and Cambridge, and other learned and responsible selectors. Several valuable scholarships at King's College, Cambridge, are filled every year from among the scholars by competitive examination. There are other scholarships and prizes open to all the members of the school, such as the Newcastle and Tomline scholarships, and prizes for modern languages, founded by the late prince consort. The scholars are lodged within the college walls.

The main portion of the students, however, numbering nearly 900, are *oppidans*, students who live out of the college, and whose friends pay liberally for their education. The tuition is the same for them as for the *collegers* or scholars. There are an upper and a lower school, managed by the head master and lower master, with a large staff of assistants. Much discussion has arisen in the last few years concerning the kind of education received at Eton, the cost at which it is obtained, and the enormous incomes derived by some of the officials. The course of education is still somewhat medieval, which regards Greek and Latin as the basis of all good education; but mathematics and natural science, under recent regulations of the governing body, receive much attention. There is great prestige connected with the college.

The chief buildings of the college consist of the chapel, the hall, the library, the schools, the provost's and master's apartments, and the lodgings of the fellows, surrounding two quadrangles; together with the boys' library and sleeping apartments, in a cluster called the new buildings, attached to the n. side of the older group. The chapel is mostly of stone; the other buildings are of brick; and the effect of the whole is very picturesque, as seen from the terrace of Windsor Castle, on the other side of the Thames. The chapel is especially beautiful. The houses of the masters are generally fitted up for the reception of oppidans as boarders. **ETONIAN**, n. ē-tōn'ī-an, a boy educated at Eton.

ETRURIA.

ETRURIA, n. *ě-tró'řĩ-ă*, anciently called also **TYRRHENIA**, or **TUSCIA**: ancient kingdom of Italy, comprehending nearly all Tuscany, Lucca, and part of the former Roman States. **ETRUSCAN**, a. *ě-trūs'kăn*, pertaining to Etruria. —*Etruria*, at a period anterior to the foundation of Rome, designates nearly the whole of Italy, together with some of its most important western islands. Its n. part, from the Alps to the Apennines, was known under the name of Etruria Circumpadana; its s. from the Tiber down to the Gulf of Paestum, or, according to some, to the Sicilian Sea, under the name of Etruria Campaniana; while the central portion, bounded n. by the Apennines and the river Macra, s. and e. by the Tiber, and w. by the Tyrrhenian Sea, was called Etruria Propria. The first two, however, did not long remain Etruscan territory, but were either reconquered by the surrounding tribes to whom they had originally belonged, or fell in o the hands of new immigrants. No historical records of that brief period of any moment having yet come to light, they do not claim our attention; while Etruria Proper, scanty as is our information about it, attracts a high degree of interest. For its physical features, see **TUSCANY**: **LUCCA**: also the Transtiberine portions of the Papal Dominions. It is to be remarked here, however, that vast expanses of that country, now either covered with deep forest, or shunned on account of malaria, were in those times fruitful, densely peopled regions. For political, or rather administrative purposes, Etruria Proper was divided into 12 sovereign cities, or rather cantons, among which the most important were Tarquinii (Corneto), the cradle of the royal family of the Tarquins, who at one time wielded the sceptre of Rome; Cære (Argylla Cervetri), which, during the war of Rome with the Gauls, offered a refuge to the Roman Flamen Quirinalis and Vestal Virgins; Veii, the greatest and most powerful city of Etruria, with 100,000 inhabitants, which carried on seven wars with Rome; Clusium (Kamars, Chiusi), the chief of which, Porsena, as principal commander of the Etruscan troops, dictated a humiliating peace to Rome after she had expelled the Tarquins; Perugia (Perugia), destroyed in the Perusian civil war (40); Arretium (Arezzo), birthplace of Mæcenas. Of other not sovereign places may be mentioned Luca (Lucca), Pisæ (Pisa), on the Arnus, with the Portus Pisanus, now Leghorn, and Florentia (Firenze, Florence), on the Arnus.

To what nation the inhabitants—called Etruscans (= Exteri, strangers) or Tuscans in the Roman, Tyrrheni or Tyrseni (*Turrēnoi*, *Tursēnoi*) in the Greek, and Rasena (Tesne Rasne) in their own language—originally belonged, and what country they came from, was debated many hundred years before Christ, and is not settled yet. All the most ancient writers, save one of the most trustworthy, Dionysius of Halicarnassus, implicitly follow Herodotus, who—confounding the Etruscans, perhaps, as is his wont, with the Lydian *Turrēnoi*, or inhabitants of the city of Tyrrha—pronounces them Lydians, though there is not the slightest similarity between these two nations, and

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though Xanthus, the Lydian historian, knows nothing whatever about a fabled famine of 18 years' duration in Lydia, followed by an emigration to Italy under a Prince Tyrrhenus. Dionysius himself offers no opinion; he calls them an indigenous race—which gives no real information; and it is surprising that some modern investigators, despairing of a rational solution of the old riddle, should have fallen back upon this evasive theory of 'autochthons.' Thucydides, in first confusing the Torrhebian pirates with the Pelasgian filibusters, gave rise to hopeless confusion about their very name. As to the innumerable theories and hypotheses since his day: Ciampi and Collar deem these people of Slavonic origin; Fréret calls them Celts; Micali, Albanese; Lami, Pfizmaier, and Stickel, Semitics; and others variously make them Goths, Scandinavians, Basques, Assyrians, Phœnicians, Egyptians, and Armenians. The most rational and generally accepted opinion is that of Niebuhr—modified more or less by Otfried Müller, Lanzi, Lepsius, Steub—of their being, when they first appear in history, a mixture of an eastern tribe, which had settled for a while in the Rætian Alps (the Tyrol of to-day), and Pelasgians, whom they had found in their new Italian seats; these latter having, in their turn, since their immigration, mixed with the Umbrians, the oldest historical inhabitants of those parts. But, this is only the most rational opinion that emerges from a mist of wild speculation: authentic proofs of it have not yet been found; the question stands to-day precisely where it stood when Dionysius wrote: 'The Etruscans do not resemble any people in language and manners.'

Immense as was their influence on Roman, and, in fact, on European civilization, very little is known of their political history. Chiefly cultivating the arts of peace, they nevertheless seem, long after their heroic period, to have been powerful enough to scare away any invader, and this probably is the reason why historians have so little to record of them; but their decline may be said to stand in an inverted ratio to the rise of Rome. The 7th and earlier half of the 6th c. B.C. had been the most powerful and flourishing epoch of the Etruscan state in its widest sense—which then probably had been in existence four or five hundred years. Whether they had put their Tarquinii as governors over conquered Rome, or whether, on the contrary, the reign of this Etruscan family would denote the subjugation of southern Etruria by Rome, is not clear; but the expulsion of the last Roman king, Tarquinius (Tarchon), called Superbus, was followed, about B.C. 507, by a war between the Etruscans, under Porsena of Clusium, and the Romans, which, though ending in a most ignominious peace, dictated within the walls of Rome, did not bring about the restoration of the Tarquinian dynasty. From the wars between Veii and Rome, which began B.C. 486, and ended—interrupted only by an occasional armistice—395, with the destruction of Veii, dates the gradual but sure extinction of Etruria as an independent state. The Gauls advancing from the n., the Etruscans were forced to

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conclude a 40 years' truce with their adversaries at any price; but these over, and the Romans being engaged with the Samnites, the Etruscans recommenced the hostilities more fiercely than ever. In this last war, the Romans succeeded, B.C. 309, under Q. Fabius Maximus, in twice defeating them, and Fabius crossed the Ciminian forest—the frontier sacred from time immemorial; and when, B.C. 283, P. Cornelius Dolabella had beaten both them and their Gallic auxiliaries in a decisive and sanguinary battle at the Vadimonian Lake, Etruria became a Roman province; and about 200 years later, the Lex Julia conferred upon her inhabitants, as a reward for their fidelity, the right of citizenship. Till that time, they had succeeded in keeping up their own singularly distinct creed, customs, traditions, language—their nationality, in fact; when Sulla, B.C. 82, infuriated by the part that they had taken against him, liberally bestowed great portions of their land upon his veterans; and abt. 50 years later, Octavianus planted his military colonies there. This wrought and completed the transformation of that mysterious conglomeration of heterogeneous races and tribes, hitherto called Etrurians, into Romans. Once more, well nigh 2,000 years after its extinction, the kingdom of Etruria (Hetruria) rose before the eyes of the world. The peace of Luneville re-created it, and conferred it on the hereditary prince, Louis of Parma; after whose death, his widow, the Infanta Louisa of Spain, administered the government for their son, Charles Louis, till 1807, when it became a French province. From 1809, it again bore the name of the Grand Duchy of Tuscany. For its modern history, see TUSCANY: ITALY.

Twelve cities are spoken of above as forming the confederacy of Etruria Proper. Similar confederacies of 12 cities were established, independently of each other, in the two other Etrurias. The cities themselves, however, cannot be definitely named now in all cases. From the fact of more than 12 autonomous ones being recorded in Etruria Proper, it would appear that some among these 12 confederates, or *populi*, possessed more than one capital city, each *populus*, however, being limited to one representative vote in the general council. The members of the confederacy were bound to appear regularly at an annual religious assembly near the temple of Voltumna, whose locality is not known. Here great fairs were held for the people; common operations of war being discussed by the *principes*, and a gen.-in-chief for the ensuing year elected from their number. Each city or canton, in the earlier times at least, had a king (Lucumo, Lauchme = Inspired), chosen for life, who at the same time acted as high-priest; and a hereditary nobility, which alone was eligible to the higher offices of state. Next to them, in the political and social scale, came the people properly so called—free, not subject personally to the nobility; lowest stood a great number of clients or bondmen, probably descendants of subjected original inhabitants. On the whole, the federal interdependence between the cities was far from close. Single cities carried on wars in which the others took no part; and when the

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confederacy resolved on general action, there were always some members which, for one reason or other, stood aloof. It appears from this that the Etruscan constitution was analogous to the Greek and Roman in their earliest stages: the community develops itself into a *polis* or city, chooses a head, or rather high-priest, and enters into a more or less intimate alliance with its neighboring cities; but, besides that king of its own, recognizes a common chief only in time of war.

The Etruscans were, as a people, less warlike than any of their neighbors, especially the Romans, and conspicuous is their want of anything like cavalry. Theirs was also the un-Italic custom of hiring soldiers, and their energies seem to have been directed principally to the more profitable occupations of trade and agriculture. One of the chief articles of their commerce was amber, which Germans brought from the Baltic to Etruria Circumpadana, whence it was conveyed to Greece by sea. In the w. parts of the Mediterranean, they were formidable as pirates; while they were welcomed by the Carthaginians and the Greeks of Magna Græcia, as importers of indigenous products of nature and art, which they exchanged for the wealth of the East and South. That their commerce within Italy must have been very extensive, appears from the fact that all the states of Central Italy adopted their system of coinage, based, like their tables of weights and measures, and many of their political institutions, on the duodecimal system.

The striking contrast between the Etruscans and their Italic and Greek neighbors, which appears in the short thickest frames, the large heads and bulky extremities of the former, and the slender limbs and graceful harmony in the whole structure of the latter, and which runs with equal distinctness through the intellectual lives of the three nations, manifests itself nowhere with greater power than in their religions. Equally distant from the abstract, clear rationalism of the Latins, and the plastic joyfulness of Hellenic image-worship, the Etruscans were, as far as their dumb fragments show—for what we find on them of human words we do not understand—chained in a dark and dotard mysticism, such as might be produced from a blending of a half-forgotten Eastern symbol-service with barbarous religious practices of northern savages, grafted upon archaic Greek notions. In their Pantheon, the predominance belongs to the evil, mischievous gods; their prisoners are welcome sacrifices to the heavenly powers; they have no silent depths where the 'good spirits' of their departed dwell, but a hell of the most hideous description, and a heaven where permanent intoxication is the bliss that awaits the virtuous. They divided their gods into two classes, and they place them in the most northern, therefore most immovable point of the world, whence they can best overlook it. The upper section is formed by shrouded, hidden gods (*Involuti*), of uncertain number, who act awfully and mysteriously, and 12 lower gods of both sexes, called *Consentes*, *Complices*. *Tinia* (Zeus, Jupiter) is the

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chief of these latter, and stands between the two divisions of the gods, receiving orders for destruction from the upper ones, while the lower ones form his ordinary council, and obey his behests. Nine of these (Novensiles) hurl lightnings at various times and with peculiar effects. The three of these deities which seem to have been the principal objects of worship were Tinia himself, armed with three different kinds of lightning, Cupra (Hera or Juno), and Menrfa (Minerva, Pallas Athene). Gods most peculiarly Etruscan are Vejovis, an evil Jupiter, whose thunderbolts have the power to deafen, and Nortia, the goddess of Fate, called also Lasa Mean. Besides these, they put a host of demons over the different portions of the creation: the heavens, the earth, and the lower regions (Penates, Lares, and Manes). Their deities generally have wings; and before the Assyrian bulls had come to light, some antiquaries established from this a connection with the Hebrew winged cherubim. Characteristic in the highest degree is their 'disciplina' or art of 'divination.' This had been revealed by Tages, grandson of Jupiter, who, according to the myth, was dug out near Tarquinii, in the shape of a childlike dwarf with gray hair—a most striking caricature of these both childish and senile practices—and who died immediately after having communicated these mysteries. They were at first the property of the noble families; but in the course of time, as others were initiated, and schools for priests were founded, these mystical and awe-striking teachings came to be written down. It is saddening to observe here again in what monstrous insanities the spirit of man occasionally revels, and that, too, in the province of what is noblest and highest—religion. The 'disciplina' was developed into an exact science, fully as minutely and casuistically sharpening its points and splitting its hairs as Hindu or Mohammedan theology would. It taught what gods hurled the different kinds of lightning; how, by the color and the peculiar quarter of the sky, the author of the bolt might be recognized; whether the evil denoted was a lasting or a passing one; whether the decree was irrevocable or could be postponed; how the lightning was to be coaxed down, and how it was to be buried. This was the speciality of the Fulgurales. The Haruspices had as their share the explanation of portents, prodigies, monsters, the flight and cries of birds, the entrails of sacrificial animals; while others ministered in the holy rites at the foundation of cities, the building of gates, houses, etc. Their ceremonies (a word derived from their town Cære) were endless and silly, but the show and pomp with which their priests knew how to surround these juggleries, and from which the Romans largely borrowed, made them acceptable in the eyes of the herd; and though Rome herself, with all her augurs, called Etruria 'the mother of superstition,' there was a certain odor of tithes and fees about these rites which made many anxious to 'preserve religion in its primeval purity.'

In the entire absence of anything like a genuine Etruscan account, even the outlines of the relation between their

religion and that of the Greeks on the one hand, and the Romans on the other, are exceedingly difficult to trace ; so much, however, is certain, that they adopted and assimilated many points of archaic Greek theology, and clothed them in a garb of their own, and that this process was repeated still more completely by the Romans in their turn, with respect to the religious notions of the Etruscans. See GREEK RELIGION : ROMAN RELIGION, ANCIENT.

The high civilization which the Etruscans possessed long before Rome was heard of, is testified by innumerable works of masonry and art. The Etruscans were of an eminently practical turn of mind, and domestic, like the northern nations. Trusting to their priests for reconciliation with the gods, who seemed always irate, but whose angry decrees could easily be foreseen and averted, they set to work in developing the inner resources of the country, and in making the best use of their intercourse with foreign countries. They thus became eminent in agriculture, navigation, military tactics, medicine, astronomy, and the like; and in all these, as well as in some of the minutiae of their dress and furniture, the Romans became their ready disciples and imitators. The division of the year into 12 months, of the months into kalends and nones and ides, the designation of the numerals, were Etruscan ; from the same source were derived the *toga prætexta* as well as the pomp of triumphs, the *lictors* and *apparitors*, down to the ivory curule chairs. The towns of the Etruscans were clean and healthful, owing to their perfect system of drainage and sewerage ; they tunneled and excavated, they embanked and irrigated, they turned swamps into cities, changed the course of streams, and excelled in various kinds of useful public and private works. Their ideal was not the beautiful or the spiritual, but a comfortable, and, if possible, luxurious existence. As a special proof of their love for their own hearth, a quality imported probably from the north, we might adduce their invention of the atrium, the common sitting-room of the family, where the master of the house sat surrounded by his penates and the figures of his ancestors, while the wife and her handmaidens plied the labors of the loom or the distaff. As in the Germanic nations, woman stood in high estimation. She was the companion, not the slave, of the husband, and thus had certainly not a little share in the softening of their primitive wildness, and in counteracting the sombreness of their creed. The fact that even in their tomb-paintings they are seen engaged in convivial carousings, dancing, races, athletic games, and that they liked that their very worship should be accompanied by the sound of flutes, horns, and trumpets, only shows that that glorious sky of theirs, their intercourse with the nations, their wealth and culture, had gradually caused their antique and gloomy austerity to wear off, even as it wore off with the Romans and other peoples ; for to assume with some that the boisterous scenes referred to were caused more or less by the despair arising from the loss of their independence, would be going too far. Licentiousness is the sure forerunner of the fall of a nation, but a

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whole people does not take refuge in enjoyment when their all is lost. We know little of Etruscan literature; it seems to have consisted mostly of rituals, religious hymns, and some historical works. Whether the Fescennines, certain mocking-songs, sung in alternate verses, with musical accompaniment, at nuptials, originated with them or not, is not decided.

We have alluded to the high proficiency of this people in architecture; they were, in fact, so renowned in this craft throughout the antique world, that, as Solomon called Phœnicians to Jerusalem to build his temple, so the Romans sought in Etruria the framers of their grandest masonic structures, such as the Cloaca Maxima, the Temple of Jupiter on the Capitol, etc. The peculiarly fantastic and, withal, powerful mind which speaks in all their institutions equally pervades their architectural productions; but, at the same time, everything that they built, they built either for practical or pious purposes. Their manner, differing in various epochs, never reached anything like a distinct national completeness, their eagerness to profit by foreign examples not allowing them to develop it to the full unalloyed. Of their walls and gates, temples and porticoes, theatres and amphitheatres, bridges and sewers, gigantic, and, in the earliest times, cyclopean—erected, in Eastern fashion, evidently by hosts of slaves—very little is extant in so complete a form as to afford exact insight into their mode of construction; and were it not for their tombs, our knowledge would be exceedingly limited. These form one of the most peculiar features in Etruscan antiquities. Hewn in rocks, either below the ground or in the face of a cliff, they were adorned outside with a somewhat Egyptian façade of a temple or a house, which semblance of a house the insides most exactly reproduce, with all their internal decorations, furniture, and utensils. Of the paintings around the walls, which are our safest and most complete guides to the inner life of this nation, more is said below. Their temples bore in primitive times, and always retained in some measure, so far as we can judge, the unfinished character of the wood-buildings of the northern mountain tribes—a square, half-house, half-fortification, overloaded with quaint ornamentation.

In their plastic and pictorial arts, Winckelmann has established three distinct styles—to which Dennis has added a fourth—viz, the Egyptian, with Babylonian analogies, the Etruscan or Tyrrhene proper, the Hellenic, and that of the *decadence*. Characteristic of the first style are the prevalence of straight lines, right angles, faces of an oblong, contracted oval, with a pointed chin, eyes mostly drawn upward, arms hanging close to the side, legs close together, drapery long in straight parallel lines, hair disposed in tiers of curls. In this style, the attitude is constrained, the action stiff and cramped. The progress shown by the second style is the greater attention bestowed on the delineation of the muscles, which swell out in disproportionate prominences on the now almost entirely nude body. The two remaining styles explain themselves. Their statuary, as it

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appears chiefly on sarcophagi and cinerary urns, likewise suggests an Egyptian origin. The figures are those of their own mystical and awful Hades, instead of the Bacchic processions of Greece and Rome. The grouping follows rather a pictorial than a plastic principle; the motion is hasty and forced; but the features of the deceased, hewn on the lid, have all the rude accuracy of a spiritless portrait. Statues of deities in wood and stone have been found, but very rarely. Of high renown were their ornaments and utensils in baked clay (*terra cotta*), in the manufacture of which objects the Veientes were especially famous. Rome at a very early period possessed of this material a quadriga and the statue of Summanus, made by Etruscans. Of the art of working in bronze, the Etruscans were supposed to be inventors; that they brought it to a very high degree of perfection is evident from the examples which remain. Statues and utensils were manufactured and exported in immense quantities, not only to Rome, but to every part of the known world. Of figures on a large scale still extant are the renowned She-wolf of the Capitol, the Chimæra in the Museum of Florence, the Warrior of Todi in the Etruscan Museum of the Vatican; a portrait-statue of an Orator, with the inscription *Aule Meteli*, in Florence; and the Boy with the Goose at Leyden. The various objects of ornament and use, found in great numbers in tombs, such as candelabra, cups, tripods, caldrons, couches, disks; articles of armor, as helmets, cuirasses, etc.; musical instruments, fans, cists or caskets, are most of them models of exquisite finish and artistic skill. Their gems are as numerous as those of Egypt, and, like them, cut into the form of the *scarabæus* or beetle. They were exclusively intaglios, of carnelian, sardonyx, and agate. On these the Etruscan artists represent groups from the Greek mythology, or the heroic cycle, lacking, as they seem to have been, in heroic legends of their own. They are found most frequently at Chiusi and Vulci, and were worn as charms and amulets. Special mention should be made of the metal *specula*, or mirrors, with figures scratched upon the concave side, the front or convex side being highly polished. These ranged over all the phases of Etruscan art, and are especially and peculiarly Etruscan. None but Etruscan inscriptions have ever been found on them. They will, no doubt, prove eventually of the highest importance, not only by enabling us to follow the gradations of artistic development step by step, but by furnishing us with lists of names of gods and persons, and, it may be, of objects.

The vases and urns found in innumerable quantities in Etruscan tombs, are admitted on all hands to be, with very few exceptions, Greek, both in design and workmanship (see *VASES*). The tomb-paintings are found chiefly in the cemeteries of Tarquinii and Clusium; and they are all the more important, as they lead us with minute accuracy from the very cradle of the individual, through the various scenes of his entire life, to its close; and this throughout the existence of the nation itself, beginning before the

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foundation of Rome, and ending in the Empire; while we follow the style in its gradual development from the Egyptian to Græco-Roman perfection. One of the annexed specimens, taken from a tomb at Corneto, represents a death-bed scene; but most of the other paintings, especially at Tarquinii, are of a very different description, as the other specimens show. Life in its merriest aspects gleams in the most vivid of colors all round—dancing, feasting, loving



*Etruscan Mirror from Vulci, with Phuphluns (Bacchus), Semele (Semele), and Apulu (Apollo).
After a drawing by Mr. George Scharf.*

hunting. The Etruscans of later times had learned in the school of the Hellenes to dread death less, and to think of the other world as one of continued joyfulness.

The Etruscan language is preserved in more than 3,000 inscriptions, and this number will no doubt be doubled by the opening of new sepulchral chambers, with which the soil of ancient Etruria is teeming. These inscriptions are found on sarcophagi, urns, vases, columns, statues, and mirrors in bronze. The latter article was a favorite object for the representation of scenes from Greek mythology, and from this source we learn the names of the principal native deities. *Tinia* was Jupiter; *Usil*, the sun; *Fufuns*, Bacchus;

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Aethlans, Vulcanus; *Thurms*, Mercurius; *Turan*, Venus; *Thalna*, Juno; *Thesan*, Aurora. Some of the minor female deities are called *Lasa*, *Maris*, *Mean*, *Vanth*. The inscriptions are of two kinds—the archaic and the more recent. The former, generally beginning with the syllable *MI*, are distinguished not merely by a more ancient form of the alphabet, but also by a more refined condition of the language. In the older inscriptions consonants and vowels are evenly balanced. But in the documents of later date, short vowels are generally omitted, and, in con-



Crater.

Amphora

Cylix.



sequence, combinations of consonants appear which remind us strongly of the cacophonous forms of some of the Slavonic languages. Compare the following specimens: 1. *Mi Tesantaia Tarhumenaiä*. 2. *Laris Sescina Lumscial*.

With regard to the grammar, the following points may be considered as established. In the singular of nouns, the nominative ends in *s*; the genitive, according to the class of declensions, in *a-s*, *e-s*, *i-s*, *u-s*; the dative in *si* or *s*. But these terminations are very often dropped, as in early

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Latin. In the Cippus Perusinus, both the largest and best preserved inscription of all now in existence, we find of the proper names Velthina and Afuna the cases: *Velthina, Velthinam, Velthinas; Afuna, Afunam, Afunas*. The suffix *al* serves mostly, but not exclusively, for the expression of a metronymic: *Thana Seianti Latinial*, for example, is Thana Seiantia, daughter of Latinia. Another very common suffix—*asa, esa, isa, usa*—designates the matrimonial relation of women: *Thana Aulnei Canznasa* is Thana Aulnea, wife of Canzna; *Tha Setumnei Pumpunisa* is Thana Setumnea, wife of Pomponius. It is clear that this suffix consists of the genitives in *as, es, is, us*, with the addition of an *a*, so that grammatically and logically the wife is defined as part and parcel of her husband. Verbal forms do not occur often, but it is certain that the preterite is formed from the root by the addition of the syllable *ce*, like *tur-ce, the-ce, lupu-ce, sval-ce*. The numerals sound rather strange. *Mach, thru, zal, huth, ki, sa*, are 1-6; but as yet the individual meaning of each of these is unknown. The same must be said of *sesphs, esal, mu* or *muu*, the numerals for 7-9. Decades are expressed by *alch(al)*, e.g., *sespalchal, muvalchl, cealchl*. 90 was probably *zathrums*. The meaning of about 10 or 12 words, such as *clan*, son; *sech*, wife; *avil*, age; *vril*, year; *hinthial*, spirit; *fleres*, statue, can be clearly established; but as yet no affinity has been discovered between these and the corresponding expressions in Aryan or other languages. The following two inscriptions are given with a translation which in one or two points is conjectural:

Vipia Alsinaï turce Versenas Caiia.

Vibia Alsinaea dedit Versenæ, Caiæ filiæ.

The second is found on the celebrated bronze statue of the orator, now in the museum of Florence;

Aulesi Metelis Ve Vesial clensi cen fleres tece

Aulo Metello Velie Vesie filio hoc signum posuit

sansl tenine tuthines chisulics.

jussu concilii publici magistratus (?).

The few bilingual inscriptions (altogether 15) throw no light on the language, as they contain only proper names. The so-called Tyrrhenian glosses, preserved in the lexicon of Hesychius, are worse than useless for critical purposes.

ETRUSCAN LANGUAGE: see ETRURIA.

ETSCH: see ADIGÉ.

ETTER-PIKE, n. *ët'ér-pîk* [AS. poison]: the lesser weaver or sting-fish, *Trachinus vipera*. **ETTER-CAP**, n. *-kâp*, a spider; hence figuratively, a virulent, atrabillious person.

ETTLE, v. *ët'l* [Icel. *atla*, or *atla*, to purpose]: in *Scot.* and *prov. Eng.*, to purpose; to design; to aspire; to expect; to attempt. **ETTLING**, imp. *ët'ling*. **ETTLED**, pp. *ët'ld*.

ETTMÜLLER, *ët'mül-ër*, ERNST MORITZ LUDWIG: 1802, Oct. 5—1877, Apr.; b. Gersdorf, in Upper Lusatia: writer on German antiquities. He studied medicine at Leipsic 1823-26,

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but subsequently the language and history of his native country. In 1830, having taken his degree P.H.D. at Jena, he began to deliver lectures there on the German poets of the middle ages; in 1833 he was called to the Zürich Acad. and in 1863 to the univ. there, as prof. of German literature. E.'s literary activity has been chiefly in the editing of the literary remains of the Middle High-German and older Low-German dialects. To the former belong his *Sant Oswaltes Leben* (Zürich 1835); *Hadeloubes Lieder und Sprüche* (Zürich 1840); *Heinrich's Von Meissen des Frouwenlobes Lieder, Leiche, und Sprüche* (Quedlinb. 1834); *Frouwen Helchen Süne* (Zürich 1846); *Heinrich's Von Veldecke Eneide* (Zürich 1852). Of poems in Low German he published, among others; *Theophilus* (Quedlinb. 1849); and *Wizlāwes IV., des Fürsten Von Rügen, Lieder und Sprüche* (Quedlinb. 1852). In 1850 appeared, under his editorship, an Anglo-Saxon chrestomathy; in the following year his much-valued *Lexicon Anglo-Saxonieum*. E. studied also old Norse literature, as is shown by an edition of the *Völuspá*, translations, and a Norse reading-book. He wrote several original poems: his *Deutsche Stammkönige* appeared at Zürich 1844; his *Kaiser Karl d. Gr. und das Fränkische Jungfrauenheer, 1487*; and his *Karl d. Gr. und der Heilige Goar, 1852*; *Herbstabende und Sommernächte* are essays on his favorite subjects (3 vols. 1865-67).

ETTRICK, *ět'rik*: pastoral vale in the s. of Selkirkshire, Scotland, watered by the Ettrick river, which rises amid bleak hills in the s.w. corner of the county near Ettrick Pen, 2,258 ft. high, flows 28 m. n.e. and falls into the Tweed. Its chief affluent is the Yarrow, which runs 25 m. from the w., through one of the loveliest of Scotch vales, and the scene of many a plaintive song. Ettrick Forest, a royal hunting tract, swarming with deer till the time of James V., included Selkirkshire and some tracts to the north. In Ettrick Vale, at Tushielaw, dwelt the celebrated freebooter or king of the Border, Adam Scot, who was summarily put to death by James V. The district derives some note from two persons in modern times—Thomas Boston (q.v.), minister of the parish of Ettrick; and James Hogg, poet, who, having been originally a shepherd in this part of the country, became known as 'the Ettrick Shepherd.'

ETTRINGITE, n. *ět'tring-īt* [named from *Ettringen*, on the Rhine, where it occurs]: in *mineral.*, name given by Lehmann to a hydrated sulphate of lime and alumina. Crystallization hexagonal. In minute needles in limestone inclosures of a lava.

ETTY, *ět'ti*, WILLIAM, R.A.: 1787, Mar. 10—1849, Nov. 30; b. York, England: artist. His father was a miller and spice-maker. Before he was 12 years of age, he was apprenticed to a printer, and served out his term of seven years of drudgery. Freed at last, and assisted by some relatives, in 1805, at the age of 18, he entered on the study of art, and, after a year's probation, was admitted a Royal Acad. student. For a series of years he was

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invariably surpassed by many fellow-students, and, as has been recorded, 'looked on by his companions as a worthy plodding person, with no chance of ever becoming a good painter.' Neither prizes nor medals fell to his share as a student; and for several years his pictures were rejected at the Royal Academy and British Institution Exhibitions. After six years of hard study he obtained a place for a picture in the Exhibition of the Royal Acad. and his works began to attract notice in 1820, when the artist was 33 years of age. The lack of early appreciation arose not so from his works evincing no talent, as from his class of subjects, and his unusual technical qualities; for long before his pictures were saleable, his powers were highly appreciated by his professional brethren. On his return from Italy, 1822, where he had been studying the great Venetian colorists, he was elected an Assoc. of the Academy. In 1824, his *chef-d'œuvre*, *The Combat—Woman pleading for the Vanquished*, was purchased by an artist, John Martin. In 1828, he was elected Academictan by the members of the Royal Acad. in the same year the Royal Scottish Acad. purchased his most important effort, the historical work illustrating the history of Judith and Holofernes. From that time E.'s pictures came into great request, and brought large prices. He always loved York, his native city, and had retired there some time previous to his death.

E. had an exquisite feeling for color, generally chose subjects that afforded scope for it, in which the nude and rich draperies were displayed. Though carelessness and incorrectness may often be observed in his drawing, it frequently shows elevation and largeness of style. He executed nine pictures on a very large scale, viz: *The Combat*; series of three pictures illustrating the delivery of Bethulia by Judith; *Benaiah slaying two Lion-like Men of Moab* (these five, the best of his large works, were purchased by the Royal Scottish Acad.); *The Syrens*, now in the Manchester Institution; and three pictures illustrating the history of Joan of Arc. His smaller works are numerous. Besides his large works he sent for exhibition to the Royal Acad. and British Institution, 1811-49 no less than 230 pictures. The following may be particularly noted: *The Coral-finders*; *Venus and her youthful Satellites arriving at the Isle of Paphos*; *Cleopatra's Arrival in Cilicia*; a composition from the 11th book of *Paradise Lost* (*Bevy of Fair Women*); *The Storm*; *Sabrina*; *The Warrior Arming*; *Youth at the Prow*, and *Pleasure at the Helm*; *The Dance*, from Homer's description of Achilles's Shield; *Britomart redeems Fair Amoret*, *Dance on the Sands*, and yet no *Footing seen*; *Amoret Chained*.—See E.'s Life by Gilchrist (Bogue, London 1855).

ETUI, or ETWEE, n. *ët-wê'* [F. *étui*, a sheath]: pocket-case for pins, needles, etc.; lady's reticule.

ETYMOLOGY, n. *ët'î-môl'ô-jî* [L. *ëtymolôgîă*—from Gr. *etîmôs*, true; *logos*, a word: L. *etymon*; Gr. *etumon*, the true source of a word: F. *ëtymologie*]: department of the

study of language which traces words to their elements, their original forms, and primary significations. ET'YMOL'OGIST, n. one who. ET'YMOLOG'ICAL, a. -mō-lī'j-i-kāl, pertaining to etymology. ET'YMOLOG'ICALLY, ad. -lī. ET'YMOL'OGIZE, v. -mōl'ō-jīz, to search into the origin and primary meaning of words. ET'YMOL'OGIZING, imp. ET'YMOL'OGIZED, pp. -jīzd. ETYMON, n. ēt'i-mōn, an original or primitive word; a root.—*Etymology* is that part of grammar that treats of the derivation of words. It embraces the consideration of the elements of words, or letters and syllables, the different kinds of words, their forms, and the notions that they convey; and lastly, the modes of their formation by derivation and composition. Etymological inquiries have been a favorite pursuit from the earliest times. In the book of Genesis, numerous indications are given of the derivation of proper names. Homer also attempts etymologies of the names of gods and men, which, however, are only more or less ingenious fancies. The grammarians of Alexandria and Varro among the Romans tried to base their etymologies on something like principle; but the wildest conjectures continued to be indulged in, and the results were little better than guess-work, till a very recent period. As philology extended its sphere, and became acquainted with the languages and grammarians of the East, who far excelled those of the West in this particular, etymology took on a new form. It no longer sought the relations of the words of a single language exclusively within itself, but extended its view to a whole group, e.g., the Teutonic, or wider still, to a whole family, as the Indo-European, or Aryan (q.v.), and became a new science under the name of Comparative Grammar. See PHILOLOGY.—*Etymologicum Magnum* is the name of a Greek lexicon, the oldest of the kind, professing to give the roots of the words. It appears to belong to the 10th c.; the author is unknown. The etymologies are mere guesses, sometimes right, often wildly absurd; but the book is valuable, as containing many traditions and notices of the meanings of old and unusual words. There is an edition by Schäfer (Leip. 1816); one by Sturz, *Etymologicum Gudianum* (Leip. 1818); another by Gaisford (Oxf. 1849).

EU, prefix, ū- [Gr.]: well; happily; prosperously; safely; it is used frequently as a prefix in English with the force of well; good; easy, etc.

EU, ūh: moderately well-built town of France, dept. of the Lower Seine, Normandy, near the mouth of the Bresle, 93 m. n.n.w. of Paris. It is remarkable for its fine Gothic church, and for the Château d'Eu, a low building of red brick, with high tent-shaped roofs of slate. E. manufactures sail-cloth, ropes, soap, lace, and silk. In the 11th and 12th c. E. was in the possession of the counts of the same name, collateral branch of the Norman royal family. After various vicissitudes, it was purchased by Mademoiselle de Montpensier 1675, whose fanciful taste has perpetuated itself in the architecture and decoration of the château. Later, it came into the possession of the Duke of Maine,

EUASTRUM—EUBOTRYS.

from whom it passed to the Duke of Penthièvre, maternal grandfather of Louis Philippe, who succeeded to it 1821. Louis Philippe expended large sums on the embellishment of the château, especially on its magnificent park and the unique portrait-gallery. The eldest son of the Duke of Nemours (b 1842, Apr. 29) received from his royal grandfather the title of Count d'Eu. He married (1864) Isabel, heiress-apparent of the throne of Brazil; and was commander-in-chief of the Brazilian army in the war with Paraguay, 1869. Compare Vatout, *Le Château d'Eu, Notices Historiques* (5 vols. Paris 1836); his *Résidences Royales* (Paris 1839).—Pop. 5,000.

EUASTRUM, n. *û-âs'trûm* [Gr. *euasteros*, rich in stars; *eu*, rich or abundant in; *asteros*, a star]: in *bot.*, genus of algae, sub-order *Desmidiæ*.

EUBŒA, *û-bê'a* (ancient, *Euboia*; Turkish, *Egripo*; Ital *Negroponte*): largest island in the Ægean Sea; a portion of the present kingdom of Greece. Until recently, it was called Negropont. It is bounded n. by the Trikeri Channel, and w. by the channels of Talanta and Egripo. It extends in a direction parallel to the mainland; is 105 English statute m. long, and 30 m. in extreme breadth, though in one part its breadth is scarcely four miles. At the narrowest part, it is connected with the mainland by a bridge. The island is intersected by a chain of mountains, running n.w. and s.e., and attaining in the centre, in the range of Mount Delphi, an elevation of about 4,500 ft. Copper and other metals are obtained in the island, which contains also numerous hot springs. The pastures are excellent, and the declivities of the mountains covered with forests of fir-trees. The climate is salubrious, the valleys well watered and very fertile, but little cultivated. The chief products are cotton, oil, wine, wheat, fruit, and honey. The inhabitants are engaged chiefly in the breeding of cattle; they export wool, hides, and cheese, as well as oil and grain. The chief towns are Chalcis (q.v.) on the n., and Carystos on the s. coast, the latter having a pop. of 3,000. E. was peopled in early historic times chiefly by Ionic Greeks, afterward by colonists from Athens, who formed a number of independent cities or states. These were at first monarchical in their constitution, but at a later period democratic. They soon rose to power and prosperity. After the Persian wars, however, E. was subjugated by the Athenians, under whose rule it continued till they were subdued by Philip of Macedon. By the Romans, it was finally united with the province of Achaia under Vespasian. In 1204, it came into the possession of the Venetians, and received the name of Negroponte. In 1470, the island was taken by the Turks, in whose hands it remained till 1821, when the inhabitants rose to vindicate their independence at the call of the beautiful Modena Maurogenia. It now forms a portion of the modern kingdom of Greece.—Pop. (1879) 95,136.

EUBOTRYS, n. *û-bôt'rîs* [Gr. *eubotrus*, rich in grapes; *eu*, rich or abounding; *botrus*, cluster or bunch of grapes]:

EUCAIRITE—EUCALYPTUS,

in bot., genus of *Ericaceæ*. *E. arborea* (formerly *Lyonia arborea*) is the sorrel-tree of America, the acid leaves of which are chewed by hunters to assuage their thirst.

EUCAIRITE, n. *ū-kār'it* [Ger. *eukairit*—from Gr. *eukairos*, seasonable; *eu*, good; *kairos*, the right point of time: named because opportunely discovered]: a soft mineral easily cut by the knife; color between silver-white and lead-gray, lustre metallic, structure massive and granular, or in black metallic films. Composition: selenium, 31·6; copper, 25·3; silver, 43·1 = 100. It is found in Sweden, Chili, etc.

EUCALYN, n. *ū-kāl-in* [Eng. *eucalyptus*, suff. *-in*]: in chem., unfermentable sugar, which separates in the fermentation of melitose (the sugar of Eucalyptus). It is a thick syrup, which polarizes to the right, and does not reduce copper solution.

EUCALYPTOCRINUS, n. *ū-kā-līp-tō-krī'nūs* [Gr. *eu*, well; *kaluptos*, covered; *krinon*, a lily]: in paleon., typical genus of the family *Eucalyptocrinidæ*. The calyx is invected upon itself, whence the name of the genus. It ranges in time from the Silurian to the Devonian rocks.

EUCALYPTOL, n. *ū-kā-līp'tōl* [Eng. *eucalyptus*; L. *oleum*, oil]: in chem., volatile oil obtained from *Eucalyptus globulus*. It contains 70 per cent. of eucalyptene and 30 per cent. of cymene.

EUCALYPTUS, n. *ū-kā-līp'tūs* [Gr. *eu*, well; *kaluptō*, I cover]: genus of trees of the nat. ord. *Myrtaceæ*, sub-order *Leptospermeæ*, containing a large number of species, natives mostly of Australia, and which, with trees of nearly allied genera, form one of the most characteristic features of the vegetation of that part of the world. The genus occurs also, though much more sparingly, in the Malayan Archipelago. The trees of this genus have entire and leathery leaves, in which a notable quantity of a volatile aromatic oil is usually present. The leaves, instead of having one of their surfaces toward the sky, and the other toward the earth, are often placed with their edges in these directions, so that each side is equally exposed to the light. Many species abound in resinous secretions, and are therefore called GUM-TREES in Australia. Some attain great size; some are found with trunks from 8 to 16 ft. in diameter; a plank 148 ft. in length was exhibited at the Great Exhibition, London, 1851. They are of very rapid growth; and their timber, when green, is soft, so that they are easily felled, split, or sawn; but when dry, it becomes very hard. It is used for a great variety of purposes, among which is ship-building. The bark of many species abounds in tannin, and has become to some extent an article of commerce. Some kinds of it are said to be twice as rich in tannin as oak-bark. The bark of some is remarkable for hardness; while some throw off their outer bark in longitudinal strips or ribbons, which, hanging down from their stems and branches, have a very singular appearance.—Among the resinous secretions of this genus is the substance called Botany Bay Kino, used

EUCCHARIST—EUCHIRUS.

in medicine as a substitute for kino (q.v.). It is the produce of *E. resinifera*, a species with ovato-lanceolate leaves, known in Australia as the Red Gum Tree and Iron Bark Tree, a very lofty tree, attaining a height of 150-200 ft. When the bark is wounded, a red juice flows very freely, and hardens in the air into masses of irregular form, inodorous, transparent, almost black when large, but of a beautiful ruby red in small and thin fragments. Botany Bay Kino is said to consist chiefly of a peculiar principle called *Eucalyptin*, analogous to tannin. About 60 gallons of juice may sometimes be obtained from a single tree, or, in the course of a year, as much as 500 pounds of kino.—*E. robusta*, Stringy Bark Tree, also lofty, yields a most beautiful red gum, which is found filling large cavities in its stem, between the concentric circles of wood.—*E. manifera* yields, from its leaves, an exudation resembling manna, less nauseous, and of similar medicinal properties. It contains a saccharine substance, different from *mannite*, from *glucose*, and from all previously known kinds of sugar. Another similar exudation, from the leaves of *E. dumosa*, is sometimes seen spread over large districts like snow, and used by the natives as food.—The Tasmanian Blue Gum Tree, one of the Eucalypti, has recently acquired great reputation for its effects in drying marshy soils, and in preventing malarious diseases. It is extremely rapid in its growth, which may account for its drying powers; and this, in its turn, may partly account for its salubrious effects; though its camphor-like odor may also have to do with it. It has been tried with decidedly beneficial effects in the Cape of Good Hope, Algeria, the Roman Campagna, and elsewhere. Unfortunately, it does not bear a severe winter. EUCALYPTUS GLOBULUS, *glöb'û-lûs* [L. *glöbus*, a ball, a sphere]: the blue gum-tree or fever gum-tree, furnishing an astringent bark and a fragrant oil. EUCALYPTI, n. plu. *û-kä-lîp'tî*, general name for all the species of Eucalyptus.

EUCCHARIST, n. *û-kä-rîst* [F. *eucharistie*—from L. and Gr. *eucharistîa*, a giving of thanks—from Gr. *eu*, well; *châris*, favor]: the sacrament of the Lord's Supper; a giving of thanks (see LORD'S SUPPER). EU'CHARIS'TIC, a. *-kä-rîs'tîk*, or EU'CHARIS'TICAL, a. *-tî-kül*, pertaining to the Lord's Supper.

EUCHEIR'US: see EUCHIRUS.

EUCHELAION, n. *û-kê-lä'ôn* [Gr. *euchê*, prayer; *elaion*, oil]: in Gr. *chh.*, oil with which a penitent guilty of a mortal sin is anointed by an archbishop or bishop and seven priests, in order to gain absolution.

EUCHEUMA, n. *û-kû'ma* [Gr. *eu*, abundant; *cheuma*, that which is poured; a flood]: in bot., genus of rose-spored *Algæ*.

EUCHIRUS, n. *û-kîr'ûs* [Gr. *eucheir*, with good hands; handy; active; dexterous; *eu*, well developed; *cheir*, the hand: so called from the exceeding elongation of the anterior tibiæ and tarsi]: in entom., the name given by Kirby

EUCHITES—EUCHRE.

to a genus of lamellicorn beetles, placed by Swainson in the family *Cetoniadæ*, sub-family *Megasominae*.

EUCHITES, n. *ū'kits* [Gr. *euchomai*, to pray]: in *chh. hist.*, a Christian sect which arose in the 4th c., though some of their tenets were older than themselves. Their name was derived from their belief that there dwelt in man a demon who could be expelled only by incessant prayer and singing. They combined with this view various opinions derived partly from Manicheism, partly from the Oriental philosophy. After a time the term Euchite became a vague one, applied to all who withdrew from the Catholic Church and spent much time alone in prayer. They were called also Massalians.

EUCHLANIDOTA, n. *ū-klān-ī-dō'ta* [mod. Gr. *euchlani-dōs*]: in *zool.*, family of rotatoria. The rotatory organs are multiple, or divided into more than two lobes; a carapace is present. There are 11 genera. **EUCHLA'NIS**, n. *-klā'nīs* [Gr. *eu*, well; *chlānis*, an upper garment of wool]: in *zool.*, typical genus of the family *Euchlanidota*.

EUCHLORINE, *ū'klo-rīn*: very explosive green-colored gas, possessing bleaching properties; prepared by heating gently a mixture of 2 parts hydrochloric acid, 2 of water, and 1 of chlorate of potash. It explodes when merely touched with a hot wire, and is most likely composed of a mixture of chlorine and chlorochloric acid ($2\text{ClO}_6, \text{ClO}_3$).

EUCHOLOGION, n. *ū'kō-lō'jī-ōn*, or **EUCHOLOGY**, n. *ū-kōl'ō-jī* [Gr. *euchōlōgion*, a prayer book — from *euchē*, prayer, vow; *lōgōs*, speech, word]: a formulary of prayers; a liturgy.

EUCHRE, *yō'ker'* or *ū'kér*: game usually played with 32 cards (all of the pack below the 7-spots being thrown out), by 2, 3, 4, and 6 persons or any number of groups of 4. Common E. has been extended so that the word E. now comprises Railroad E., Set-Back E., Napoleon, French E., and Progressive E., in each of which the number of cards and players and the style of playing varies. The most popular form, known as E., is played by 2 or 4 persons. In the latter the players take sides as partners either by choice or by 2 matching on the cut of the cards. In 3-handed E., 2 play and the third counts with the winner of each hand, each player engaging in every third hand. In E. the cards have the same values as in whist, in suits not trumps, ace highest, seven lowest; but in the trump suit, the knave of the suit turned up, called the *right bower*, is the highest trump, and the other knave of the same color, called the *left bower*, is the next highest. The ace of the suit ranks third, and the king and queen follow respectively. Thus, a heart is turned, or made trump, the knave of hearts is highest, knave of diamonds next, and ace, king, and queen of hearts follow. Players cut for deal; the lowest takes it, and deals to the left 2 cards around, and then 3; and turns up the first card on the pack, talon, or deck, as the remaining cards are variously known. After the first hand the deal passes on the left to each player in rotation, the cutting

EUCHRE.

between hands being by the player on the right of the dealer. The game of each hand is 5 points, represented by as many tricks. Where one side takes all 5 tricks, it has a *march*, and counts 2; 3 tricks are necessary to score 1 point; 4 tricks count no more than 3; and the failure of a player or side which takes up, orders up, or makes trump, to secure 3 tricks, is called a *E.*, and, in common *E.*, gives the opponent 2 points. The object of the play is to win 3 tricks or 5. When 2 play, the non-dealer decides by his hand, whether he will play or not, and either *passes* or *orders up* accordingly. If he passes, the dealer may take up the trump, discarding one card for it, or he also may pass it; but if the trump is ordered up, the dealer must obey and discard as before. If the non-dealer and the dealer pass, the latter turns the trump card over, and the non-dealer may make or designate trumps from his hand; if he again passes, the dealer may make trump; and if he declines, both hands are thrown up, and the deal passes to the next player. Where a trump is made from hand, the game proceeds the same as where it is turned up, the non-dealer leads, the dealer plays to it, and the 2 cards (where 2 are playing) constitute a trick; the second player must follow suit if able; if not, he may trump or *throw away*, i.e., play any card he pleases. The highest card of the suit led wins the trick; trumps win other suits; and the winner of the trick leads. In 4-handed *E.*, the partners sit opposite each other. If the first hand passes, the second may *assist*, which means that the dealer (the partner) is to take up the trump. The hand is then played, the player to the dealer's left having the lead, and each playing a card in turn. In this form of the game 4 cards constitute a trick. When a player has a hand with which he believes he can win all the tricks, he may *play alone*, i.e., single-handed, against the two opponents; he also can do so when he or his partner orders up, when his partner offers to assist, or when he takes up or makes a trump. If he succeeds he scores 4 points, if euchered his opponents score 4. Sometimes, as in Railroad *E.*, when a player determines to play alone, one of his opponents agrees to play alone also, and the game is finished by the two players. A dealer or maker of trumps, or the partner of a dealer, may call for his partner's best card, and play alone after discarding, winners and losers scoring 4 as the game results. PROGRESSIVE EUCHRE is a recent development of the game of *E.*, so formulated that a large number of ladies and gentlemen can play it at one time. Progressive *E.* has become one of the most popular society diversions, and is made the basis for evening parties, with the accompaniments of prizes, music, etc. The game is played the same as four-handed *E.*, with 5 points. Each group of four players occupy a table; hence, if there are 40 players there must be 10 tables. The hostess hands each player a favor, which, attached to the dress or coat, designates the table at which first he or she must sit. When all the company are seated, the game begins at each table at the tap of a bell, and when that at the first table is finished all stop playing at another tap. The successful players at

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the first table retain their seats till after the second game, and the unsuccessful ones are transferred to the last table, at each game the losing partners are moved to the last tables, and the winning ones advance from first to second, third, fourth, etc. Victors add a star, and losers a booby, or green label, to their favors. Various kinds of prizes are provided for the winners of the largest number of honors, gold labels, or stars, as well as for those who receive the largest number of green or booby labels.

EUCHROITE, n. *ū'krō-īt*: a bright green mineral of vitreous lustre; its hardness 3·5 to 4; its sp. gr. 3·39. Composition: arsenic acid 32·42 to 34·42; oxide of copper 46·97 to 48·09; water 18·80 to 19·31.

EUCHRONE, n. *ū'krōn* [Gr. *euchroos*, well colored; *eū*, well; *chrōs*, color]: in *chem.*, dark blue insoluble substance formed when zinc is added to an aqueous solution of euchroic acid.

EUCHYMY, n. *ū'kī-mī* [Gr. *euchumia*; *eu*, well; *chumos*, juice; *chyme*]: in *med.*, a good state of the fluids in the body.

EUCHYSIDERITE, n. *ū-kī-sīd'ēr-īt*: same as pyroxene (q.v.).

EUCLASE, n. *ū'klās* [F. *euclase*—from Gr. *eu*, well; *klāein*, to cleave]: prismatic emerald, a fine green mineral found in Brazil and Peru.

EUCLEA, n. *ū'klē-a* [Gr. *eukleia*, good fame; glory; *eu*, good; *kleos*, glory: named from its evergreen foliage]: in *bot.*, genus of *Ebenaceæ*, from Africa.

EUCLID, *ū'klīd*: sometimes called the father of mathematics: b. Alexandria, about B.C. 300. We know little more of his history than that he belonged to the Platonic school of philosophy, and taught mathematics in the famous school of Alexandria, during the reign of Ptolemy Soter. Though he did not create the science of mathematics, as is sometimes represented, he made prodigious advances, especially by his rigorous method and arrangement. In this respect he has perhaps never been excelled, and his *Elements of Geometry* at the present day hold their place as a text-book. Besides the *Elements*, there are extant treatises on music, optics, data, etc., ascribed to E., the authenticity of some of which is doubtful. The best editions of the whole reputed works of E. are those of David Gregory (Oxf. 1703) and Peyrard (3 vols. Par. 1814–18). The oldest Greek edition of the *Elements* appeared at Basel 1533; the best is that of August (2 vols. Berlin 1826). Of English editions of E.'s *Elements*, those of Simpson and Playfair are considered best. For full account of everything connected with E. and his works, see Smith's *Dictionary of Greek and Roman Biography*.

EUCLID, of Megara: d. abt. B.C. 424: Greek philosopher, often confounded with the mathematician of the same name. He was one of the earliest disciples of Socrates. Although Megara lay at a considerable distance from Athens, and all Megarians were forbidden to enter the

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Athenian territories under pain of death, E. came into the city in the evening in female disguise, to enjoy the instruction of Socrates. After the death of his master, he established a school of his own, which received the name of the Megaric School. The basis of his system was the Eleatic dogma of a one, only, universal substance, or existence. Blending with this the Socratic idea of the predominance of the moral element, E. held this one real existence to be *the good*, though it receives various names under its special manifestations.

EUCLIDIUM, n. *ū-klīd'ī-ūm* [Gr. *eu*, well; *kleidion*, a little key; *kleidoō*, I lock up: named because the pods are effectively shut]: in *bot.*, typical genus of *Euclididæ*, a family of crucifers, tribe *Pleurorhizæ*.

EUCNEMIDÆ, n. *ū-nē'mī-dē* [Gr. *euknemis*, well greaved; *eu*, well; *knēmis*, a greave, a legging stretching from the knee to the ankle]: a family of beetles, tribe *Pentamera*.

EUCRASY, n. *ū'kra-sī* [Gr. *eukrasia*; *eu*, well; good; *kra-sis*, a mixing]: in *med.*, a well-balanced temperament.

EUDÆMONISM, n. *ū-dē'mōn-izm* [Gr. *eudaimōn*, happy; *eu*, good; well; *daimōn*, a spirit]: system of philosophy which places the *summum bonum* in the promotion of the happiness of humanity, and teaches that the most virtuous act of which an individual is capable is to render others happy. **EUDÆMONIST**, n. *-ist* [Gr. *eudaimōn*, happy]: believer in eudæmonism. **EUDÆMONISTIC**, a. *-ik*, pertaining to or of the nature of eudæmonism.

EUDIALYTE, or **EUDIALITE**, n. *ū-dī'a-līt* [Ger. *eudialyt*—from Gr. *eu*, easily; *dialuō*, I part asunder, I dissolve; *eu*, well; *luō*, I loosen, I dissolve, in allusion to the facility with which it dissolves in acids]: a rhombohedral red mineral of vitreous lustre, translucent or nearly so; its hardness 5·5; sp. gr. 2·90 to 3·01. Composition: silica, 45·70 to 54·10; zirconia 10·90 to 15·60; sesquioxide of manganese 1·15 to 2·93; sesquioxide of iron 6·37 to 7·86; lime 9·23 to 12·06; soda 11·40 to 13·92, etc. There are two varieties—eudialyte proper, of which the double refraction is positive, and eucolite, in which it is negative. It is found in north Greenland, Norway, and Arkansas.

EUDIOMETER, n. *ū-dī-ōm'ē-tēr* [Gr. *eudīā*, fair or fine weather; *metron*, a measure]: instrument introduced as a measurer of the goodness of air in any locality; but now employed generally in the analysis of gases for the determination of the nature and proportions of the constituents of any gaseous mixture. The instrument is now made of glass in the form of a tube, hermetically sealed at one end, open on the other. The tube may be straight, or bent in the shape of the letter U. In either case, the tube is graduated or marked off in equal-sized divisions from the closed end onward, so as to provide accurate measurement of the volume of gas placed within; and two platinum wires are inserted through the glass near the shut end of the tube, and closely approach, but do not touch, each

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other. These wires are intended for the conveyance of electric sparks through any mixture of gases, so as to cause the combustion of certain of them. For the modes of manipulating with the eudiometer, see GAS, ANALYSIS OF. EU'DIOM'ETRY, n. -ě-trě, the art or practice of measuring the quantity of oxygen in the air or in a gaseous mixture. EU'DIOMET'RIC, a. -mět'rik, or EU'DIOMET'RICAL, a. -rĭ-kāl, pertaining to.

EUDIOSMEÆ, n. ū-dĭ'ŏs'mē-ě: in bot., tribe of *Rutaceæ*, tribe *Diosma*.

EUDOCIA, ū-dŏ'shĭ-a: wife of the Byzantine Emperor Theodosius II; d. 460–461. She was daughter of the sophist Leontius or Leon, who instructed her in the literature of Greece and Rome, in rhetoric, geometry, arithmetic, and astronomy. Her accomplishments and singular beauty were reckoned by Leontius a sufficient fortune, for at his death he left all his property to her two brothers. E. appealed to the emperor at Constantinople. Pulcheria, sister of Theodosius, was interested in the maiden, and thought she would make a suitable wife for the emperor. But as E. (or, more properly, Athenais, for this was her name until her baptism) had been brought up a pagan, it was necessary first to convert her. This was easily accomplished. E. was married to the emperor A.D. 421. For many years, however, Pulcheria ruled in the imperial household and councils—E., according to Nicephorus, 'submitting to her as mother and Augusta;' but in 447, a quarrel broke out between them in regard to the Eutychian heresy, of which E. had become a supporter. At first, E. was triumphant, and Pulcheria was banished; but in a short time the emperor was reconciled to his sister, and treated E. so sharply that she retired to Jerusalem, where she died. Her latter days were spent in works of piety and charity. She enriched churches, rebuilt the walls of the Holy City, and founded many monasteries and hospitals. Through the influence of the famous Simeon Stylites, she was induced to renounce Eutychianism, and become an orthodox Catholic Christian. E. was a poetess of considerable merit. She wrote a poem in heroic verse on the victory of the troops of Theodosius over the Persians, 421 or 422; a paraphrase of eight books of Scripture; a paraphrase of Daniel and Zechariah, and a poem in three books on the history and martyrdom of Cyprian and Justina. The authorship of *Homero-Centones* also has (but without sufficient reason) been attributed to her. This is a work composed of verses taken from Homer, and so arranged as to appear a history of the fall of man and of his redemption by Christ. It has been often published.—EUDOCIA was the name of several other Byzantine princesses.

EUDOXIANS, n. ū-dŏks'ĭ-ănz: in *chh. hist.*, followers of Eudoxius, who from A.D. 356 was bishop of Antioch, in Syria, and from 360 to his death in 370 bishop and patriarch of Constantinople. He was successively an Arian, a Semi-Arian and an Aëtian. Respecting the Trinity, he believed the will of the Son to be differently affected from that of the Father.

EUDOXUS—EUGENE.

EUDOXUS, *û-dôks'ûs*, of Cnidus: called by Cicero the prince of astronomers: lived about B.C. 366. He studied under Plato and afterward went to Egypt, where he resided 13 years, and had much intercourse with the Egyptian priesthood, from whom he is supposed to have derived his superior knowledge. His last years are said to have been spent on the summit of a high hill, that he might have the starry heavens ever before his eyes. There is little reason for believing that E. deserves great admiration for his attainments in astronomy. He probably introduced the sphere into Greece, and may have corrected the length of the year, upon Egyptian information, but he appears to have been but an indifferent observer of heavenly phenomena, and Delambre considers that he was ignorant of geometry. E.'s works are entirely lost, and our only reliable sources of information regarding him are the poem of Aratus and the commentary of Hipparchus.

EUDYTES, *n. û-dî'tês* [Gr. *eu*, good; *dutês*, a diver—from *duô*, I dive]: in *ornith.*, genus of *Spheniscidæ*. *E. demersa* is the jackass penguin.

EUFAULA, *û-faw'la*: city of Barbour co., Ala.; on the w. bank of the Chattahoochee river; terminus of the Montgomery and E. and the Southwestern Georgia railroads; 50 m. w. of Columbus, 80 m. e.s.e. of Montgomery. The largest steamboats can ascend the river to E. all the year round. It contains 7 churches, 2 national banks (cap. \$159,000), and 1 private bank, public hall, fair ground, female college, school for colored children, 3 hotels, 2 weekly newspapers, several cotton warehouses, and carriage and furniture factories. The average sales of cotton are 30,000 bales annually. Pop. (1870) 3,185; (1880) 3,836; (1890) 4,394.

EUGENATE: see **EUGENOL**.

EUGENE, *û-jên'* FRANÇOIS (le Prince François-Eugene de Savoie-Carignan), better known as Prince **EUGENE**: general and statesman: 1663, Oct. 18—1736, Apr. 21; b. Paris; son of Eugene Maurice, Count of Soissons, and of Olympia Mancini, niece of Cardinal Mazarin. He was intended for the priesthood; but the banishment of his mother to the Low Countries by order of Louis XIV., was so deeply resented by him, that he indignantly renounced his country, and entered the service of Emperor Leopold as a volunteer against the Turks. Subsequently, the French government made him most flattering offers, but he never returned to the service of his native country. He showed extraordinary military talent in the Turkish war, especially at the famous siege of Vienna, 1683, and soon rose to a high position in the army. In the Coalition war against Louis XIV., in Italy, he was active; and 1691 he was raised to the command of the imperial army in Piedmont. On his return to Vienna, he was placed at the head of the army of Hungary, and defeated the Turks, with immense slaughter, in the famous battle of Zenta, 1697, Sep. 11. The booty obtained was almost incredible,

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amounting to several millions sterling. In 1701 broke out the Spanish War of Succession. E. for two years commanded the army of Italy, but his forces were too small for any deeds of importance. In 1703, being appointed pres. of the council of war, he became thenceforth the prime mover of every undertaking. He first took command of the imperial army in Germany, and with Marlborough gained a brilliant victory at the battle of Blenheim, 1704, Aug. 13, when the two commanders defeated the French and Bavarian army. E. afterward saved Turin, and expelled the French from Italy in 1706. He shared, too, with Marlborough the glory of the fields of Oudenarde (1708) and Malplaquet (1709); but being crippled in his resources by the retirement of Holland and England from the contest, he was unable to withstand the enemy on the Rhine, and his defeat by Villars at Denain, 1712, July 24, was followed by other disasters, until the peace of Rastadt put an end to the war. In 1716, on the recommencement of the war against the Turks, E. defeated an army of 180,000 men at Peterwardein, took Temeswar, and in 1717, after a bloody battle, gained possession of Belgrade. After the peace of Passarowicz, concluded in the following year, he returned covered with glory to Vienna, where, during the succeeding years of peace, he labored with unwearied energy in the cabinet. When the question of the succession to the throne of Poland brought on a new war with France, E. appeared again on the Rhine; but being now advanced in years, and destitute of sufficient resources, he accomplished nothing of importance. After peace, he returned to Vienna, where he died. E. was small in stature, with thin face, and long nose; he was simple in dress and manner, and indulged profusely in snuff. An enthusiast in his profession, and a strict disciplinarian, he was also kind-hearted and sympathetic, and always carefully attended to the wants of his men. He introduced no new tactics in the art of war, and was deficient in the guidance and command of masses; but by his rapidity of perception and decision, and faculty for making the best of existing circumstances, which was his *forte*, he raised the *prestige* of the Austrian arms to an eminence unequalled before or since. He served successively under three emperors, of whom he was wont to say, that in Leopold I. he had a father, in Joseph I. a brother, and in Charles VI. a master. E.'s political writings, published by Sartori, are important for the light that they throw on the history and the manners of the time. Compare Dumont, *Histoire Militaire du Prince Eugene*; Ferrari, *De Rebus Gestis Eugenii* (Rome 1747); Campbell's *Military History of Prince Eugene and the Duke of Marlborough*; and the monographs of Kausler (1838), Arneth (1858), and Von Sybel (1861).

EUGENESIS, n. *û-jěn'ě-sīs* [Gr. *eu*, well; *genesis*, origin; source]: quality of breeding well or freely; production of young by the union of individuals of different species or stocks.

EUGENIA.

EUGENIA, *û-jě'nî-â*: genus of plants of the nat. ord. *Myrtaceæ*, nearly allied to *Myrtus* (see MYRTLE), and differing only in having a 4-parted instead of a 5-cleft calyx, four instead of five petals, and a 1-2-celled berry, with one seed in each cell. The species are trees and shrubs, natives chiefly of tropical and sub-tropical countries. The dried fruit of *E. Pimento* and *E. acris* forms the spice well known as allspice, Jamaica pepper, or PIMENTO (q.v.). The seeds of *E. Tabasco* also are used as a condiment. Other species yield some of the finest fruits of tropical regions, remarkable for their delicious balsamic odors. Among these is the MALAY APPLE (*E. Malaccensis*), native of the Malayan archipelago and of the South Sea Islands, a low tree, with ovate-oblong smooth leathery leaves, and fruit in size and shape resembling a small apple, of a beautiful red color, and with a white juicy pulp. This fruit has an agreeable odor, like that of the rose, whence it is sometimes called ROSE APPLE; a name which, on the same account, is often extended to the fruits of allied species, as *E. aquea*, and very often given to the JAMBOS or JAMBOSADE (*E. Jambos* or *Jambosa vulgaris*), an E. Indian fruit, now cultivated in all tropical countries. This fruit is pear-shaped, about the size of a hen's egg, white or red. The tree is 20 or 30 ft. high, much branched, with leaves somewhat like those of the peach, and greenish-yellow flowers in terminal bunches. *E. cauliflora*, a Brazilian species, cultivated in most of the gardens of the diamond and gold districts of the south of Brazil, yields a very fine fruit of a black color, about the size of a green-gage plum, called the JABUTICABA or JABOTICABUROS. Similar fruits are produced by other Brazilian species, particularly *E. dysenterica*, *E. inocarpa*, and *E. Brasilensis*. The BASTARD GUAVA (*E. pseudopsidium*) and the



Cayenne Cherry (*Eugenia Michellii*).

CAYENNE CHERRY (*E. cotonifolia* and *E. Michellii*) produce fruits which are held in considerable esteem in the W. Indies. One species only, the UGNI (*E. Ugni*), native of Chili, appears to be sufficiently hardy for the climate of

EUGENIACRINIDÆ—EUGENIUS.

southern temperate regions: it has been recently introduced into the south of England, and much extolled as a fruit shrub. Its flowers are very fragrant, and its fruit pleasant. It is much cultivated in Chili; and a refreshing beverage, with an agreeable balsamic odor, is made of the expressed juice mixed with water. The fruit is of the size of a black currant, somewhat flattened, and of a brownish-red color.—The bark of many species of *E.* is very rich in tannin. Some produce good timber.

EUGENIACRINIDÆ, n. *ū-jěn-ī-ă-kri nī-dē* [*L. eugenius; crinon*, a lily]: in *paleon.*, family of *Crinoidea*. Range in time, from the Oolite to the Chalk. *Eugeniocrinus* is the type.

EUGENIC, a. *ū-jěn'ik*: obtained from or relating to cloves. **EUGENIC ACID**: see **EUGENOL**.

EUGENIE-MARIE DE GUZMAN, *ūh-zhā-nē'-mă-rē' dá góth-măr'*: Empress of the French: b. Granada in Spain, 1826, May 5; second daughter of the Count of Montijo and of Marie Manuela Kirkpatrick; descendant, on the father's side, from an old and noble Spanish family, which, by marriages at various times, acquired the right to assume the names of Guzman, Fernandez, Cordova, La Cerda, and Levia, and contracted alliances with the noble families of Téba, Banos, and Mora. By her mother—also born in Spain, and the daughter of Mr. Kirkpatrick, some time English consul at the Spanish seaport of Malaga—she is connected with an ancient Scottish family—the Kirkpatricks of Closeburn—which still exists, but no longer in possession of their original property. She was educated principally at Madrid, and spent a great portion of her youth in travelling with her mother, under the name of Countess de Téba. In 1851, she appeared at the *fêtes d'Elysée* in Paris, where her beauty and graceful demeanor attracted the notice and excited the admiration of Emperor Louis Napoleon, who married her 1853, Jan. 30, at Notre Dame. On that occasion an amnesty was granted to 4,312 political prisoners. In 1859, *E.* filled with ability the office of regent. During the Franco-German war in 1870, *E.* was again regent, but had to flee to England after the emperor became a captive. Her only son, the prince imperial, b. 1856, Mar. 16, completed his military education in England, and was killed 1879 while serving as a volunteer in the Zulu war, in s. Africa.

EUGENIN, n. *ū-jěn'in*: in *chem.*, clove camphor, a crystalline substance deposited from water which has been distilled from cloves. Nitric acid turns it blood red.

EUGENIUS, *ū-jē'nī-ūs*, IV., Pope: began pontificate 1431; d. 1447; b. Venice. The great event in his career was the schism created in the church by the proceedings of the Council of Basel, which had been convoked by *E.*'s predecessor, Martin V., and showed strong tendency to ecclesiastical reform. *E.* was kept in perpetual trouble by this council, and at last, having been compelled to flee from Rome, opened a new council at Ferrara, 1438, and issued a

EUGENOL—EUGUBINE TABLES.

bull of excommunication against the bishops assembled at Basel, whom he pronounced to be 'a satanic conclave, which was spreading the abomination of desolation into the bosom of the church.' The result was, that the Council of Basel formally deposed him from his pontifical office 1439, and elected in his stead Amadeus VIII., Duke of Savoy, under the title of Felix V. The conduct of France and Germany seemed to warrant this bold step, for Charles VII. had introduced into the former country the decrees of the Council of Basel, with some modifications, through the Pragmatic Sanction (1438), and the same thing happened in Germany by means of the Deed of Acceptance (1439). At the Council of Ferrara, John Paleologus II., Emperor of Constantinople, and more than 20 Greek bishops, presented themselves, and a union between the two great divisions of Christendom—the Greek and Latin Church—was for a moment effected, 1439, July. Discord, however, broke out almost immediately, and the two have ever since remained separate. E.'s rival, Felix, did not obtain much recognition, and after the death of E. at Rome he had to give way in favor of Nicholas V. E.'s pontificate was stormy and unhappy, and in his old age he is said to have regretted that he ever left his monastery.—The name EUGENIUS was borne by three other popes.

EUGENOL, n. *ū-jěn-öl* [mod. L. *eugenia*: Eng. *alcohol*]: $C_{10}H_{12}O_2$, also called Eugenic-acid; contained in the volatile oil of *Caryophyllus aromaticus* (oil of cloves), and in oil of pimento.

EUGLENA, n. *ū-glē'nă* [Gr. *euglēnos*, bright-eyed; *eu*, well, bright; *glēnē*, the pupil of the eye, the eye ball]: in bot., microscopic and animal-like plant. It is locomotive, with a red-eye speck, a tail-like process, and a single flagelliform filament. The species or forms are present in some pools to such an extent as to render the water green or red, and form a brilliant pellicle on the surface. The coloring matter is insoluble in water, but is soluble in alcohol, from which it crystallizes in octohedra. EUGLE'NIA, n. -nĭ-ă, in zool., name given by Dujardin to a family of infusoria, nearly the same as *Astasiæa* of Ehrenberg. They were supposed to belong to the order *Flagellata*.

EUGRATIOLEÆ, n. *ū-grăt-ĭ-ō'lē-ē*: in bot., sub-tribe of scrophulariads, tribe *Gratioleæ*.

EUGUBINE TABLES, *ū-gū-bĭn* [Lat. *Tabulæ Eugubinæ*]: seven bronze tablets, the inscriptions on which present a comprehensive and very remarkable memorial of the Umbrian language. They were discovered 1444 at Gubbio (anc. Iguvium or Eugubium), where they are still preserved. The characters on four of the tablets are Umbrian, on two Latin, and on one partly Latin and partly Umbrian. The language employed, however, is in all cases the same, and differs both from Etruscan and Latin, but resembles somewhat the older forms of the latter, and also the Oscan dialects, so far as we know them. The subjects of the inscriptions are directions concerning sacrificial usages and forms of prayer, and they seem to have been inscribed three or

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four centuries before the Christian era. Philip Bonarota first published them in complete form in Dempster's *Etruria Regalis* (2 vols. Florence 1723-4). The first really judicious attempt at interpretation was that of Lanzi, in his *Saggio di Lingua Etrusca* (3 vols. Rome 1789), who points out the important fact that they related to sacrificial usages, etc. His views have been carried out by Ottfried Müller in *Die Etrusker*; Lepsius, *De Tabulis Eugubinis*, etc. The most accurate copy of the inscriptions is given by Lepsius in *Inscriptiones Umbrice et Oscæ* (Leip. 1841); the best and most complete work on the language and contents of the tablets is that of Aufrecht and Kirchhoff, *Die Umbrischen Sprach. Denkmäler* (1849-51).

EUHARMONIC, a. *ū-har-mōn'ik* [Gr. *eu*, well; good; *harmonikos*, harmonic]: in *mus.*, producing perfect harmony or concord; used to distinguish concordant sounds from those produced by the tempered scale.

EUHEMERISM, n. *ū-hēm'ēr-izm* [Gr. *Euēmēros*: L. *Euhēmērus*, a Greek writer, B.C. 316, who treated myths as dressed-up plain histories]: system of mythological interpretation which reduces the gods of old to the level of distinguished men, and considers the myths as founded on real histories (see MYTH). **EUHEMERIST**, n. *-ist*, one who believes in or maintains these views. **EUHEMERIS'TIC**, a. *-is'tik*, pertaining to.

EUKAMPTITE, n. *ū-kāmp'tīt* [Gr. *eukamptēs*, well bent or curved; *eu*, well; *kamptō*, I bend, I curve]: in *mineral.*, according to Dana, a hydrous variety of biotite.

EULENSPIEGEL, TYLL: see OWLGLASS.

EULER, *yō'ler*, LEONARD: 1707, Apr. 15—1783, Sep. 7; b. Basel: one of the greatest of mathematicians. He received his first instructions in mathematical science from his father, pastor of the neighboring village of Riehen. At the Univ. of Basel, he studied under John Bernouilli, and was the friend of Daniel and Nicholas Bernouilli. At the age of 19, he was second in the contest for a prize offered by the Acad. of Paris for the best treatise on the masting of ships. His friends, the Bernouillis, had been called to St. Petersburg by Catharine I., when she founded the Acad., and they now induced E. to settle in that capital, 1730, as prof. of physics. Three years later, he exchanged his professorship for a place in the Academy. From that time, he continued to labor in mathematics with astonishing ardor. More than half the mathematical treatises in the 46 quarto vols. published by the St. Petersburg Acad. 1727 to 83 are by E., and at his death he left more than 200 treatises in ms., afterward published by the Academy. The Paris Acad. of Science awarded him the prize on ten several occasions, one of which was his treatise on Tides, 1740. In 1741, he accepted the invitation of Frederick the Great to Berlin. He returned to St. Petersburg 1766, where he was made director of the mathematical dept. of the Acad., and where he died. The last years of his life were spent in total blindness.

E. was amiable and religious, always cheerful and good

EULOGY—EUMENIDES.

humored; in society, he was distinguished for agreeable wit. It was doubtless his residence in St. Petersburg that led him to the application of mathematics to the building and management of ships, as embodied in his *Théorie de la Construction et de la Manœuvre des Vaisseaux* (Petersb. 1773). The great problems left by Newton to his successors were the objects of his unceasing research. On physical subjects, E. often adopted extremely untenable hypotheses. He occupied himself also with philosophy in the proper sense of the word. He undertook to prove the immateriality of the soul, and to defend revelation against free-thinkers. In his *Lettres à une Princesse d'Allemagne sur quelques Sujets de Physique et de Philosophie* (3 vols. Berl. 1768; new ed. Par. 1812; translated into English), he attacked Leibnitz's system of monads and of a pre-established harmony. But this was not the field in which he was best fitted to shine; his proper domain was the abstruser parts of pure mathematics. His most important works of this class are *Theory of Planetary Motion*, *Introduction to the Analysis of Infinites*, *Institutions of the Differential and of the Integral Calculus*, and *Dioptrics*; all, as well as *Opuscula Analytica*, in Latin. His *Introduction to Algebra* is well known.

EULOGY, n. *ū' lō-jī* [Gr. *eulōgĩa*, good language, praise—from *eu*, well; *logos*, a discourse]: the praise of any one, written or spoken; encomium; praise. **EULOGIC**, a. *ū-lōj'ik*, or **EULOGICAL**, a. *ī-kāl*, containing praise. **EULOGICALLY**, ad. *-lī*. **EULOGISTIC**, a. *ū-lō-jis'tik*, or **EULOGISTICAL**, a. *-tī-kāl*, containing praise; commendatory. **EULOGISTICALLY**, ad. *-lī*. **EULOGIUM**, n. *ū-lōjī-ūm*, praise; commendation; panegyric; eulogy. **EULOGIZE**, v. *ū-lō-jiz*, to praise highly; to extol. **EULOGIZING**, imp. **EULOGIZED**, pp. *jīzd*, praised—**SYN.** of 'eulogy': panegyric; applause; eulogium.

EULOPHIA, n. *ū-lōf'i-a* [Gr. *eulophos*, well plumed; *eu*, well; *lophos*, the back of the neck, the crest of a helmet: named because the labellum bears elevated lines or ridges]. in *bot.*, genus of orchids, tribe *Vandee*, family *Sarcanthidee*.

EUMANITE, n. *ū'man-īt* [Gr. *eu*, very; *manos*, scanty, scarce]: in *mineral.*, a variety of brookite found in minute crystals at Chesterfield, Mass., in an albite vein.

EUMENES, n. *ū'mēn-ēz* [Gr. *Eumenes* as a Greek proper name, borne by various kings; as adjective, *eumenēs*, well disposed, gracious; *eu*, well; *menos*, temper, disposition]: in *entom.*, typical genus of the family *Eumenidee*. The genus, which is extensive, consists of large and, as a rule, gaily colored insects, with a very long petiole and a pyriform abdomen. **EUMENIDÆ**, n. *ī-dē*, family of solitary wasps akin to the *Vespidee*, in which they are sometimes merged.

EUMENIDES, *ū-mēn'ī-dēz* [Gr., literally, the well-minded or benign goddesses]: euphemistic name of certain fearful beings, whose true name of Erinnyes, or Erinnyes, it was considered unlawful to utter. Their Latin name was *Furiee* or *Diræ*. They are mentioned by the earliest poets,

EUMIMOSEÆ—EUNICE.

and they play a prominent part in the writings of the tragedians, where their sphere of action is much extended. In the earliest times, Homer and Hesiod represent them as avenging and punishing perjury and murder, and the violation of filial duty and of the rite of hospitality; they were regarded also as goddesses of Fate (like the *Parcæ*), and had a share in the grim Providence which led the doomed ones into the way of calamity. A part of their function was also to hinder man from acquiring too much knowledge of the future. In these poets, their number is sometimes undefined; sometimes they appear as one. The limitation to the number three, as well as their names *Alecto*, *Megæra*, and *Tisiphone*, is of a later period, a whole chorus of *Eriinyes* appearing in the writings of *Æschylus*. According to Homer, they dwelt in *Erebus*, and with this the duration after death of the punishments which they inflict is connected. Hesiod calls them the daughters of *Ge* and *Uranus*. *Æschylus* describes them as having the features of gorgons and harpies, their bodies covered with black, serpents twined in their hair, and blood dripping from their eyes. The later poets and sculptors represented them in the more pleasing form of winged virgins, attired in the garb of huntresses, bearing torches in their hands, and with a wreath of serpents round their heads. Gradually, they came to be considered goddesses of the infernal regions, who punished crimes after death, but seldom appeared on earth. In Athens, their worship, which like that of the other infernal deities, was conducted in silence, was held in great honor. The sacrifices offered to them were black sheep and libations of *nephalia*—i.e., honey mixed with water. The turtle-dove and the narcissus were sacred to them. They had a sanctuary in the vicinity of the *Areopagus*, and one at *Colonus*.

EUMIMOSEÆ, n. *û-mî-mō'sê-ê*: in bot., typical tribe of the sub-order *Mimoseæ*.

EUMOLPUS, *û-mōl'pūs* [Gr. 'sweet singer']: in the later mythology of Greece, son of *Poseidon* and *Chione*. He was brought up in *Ethiopia*, whence he went to *Thrace*, and afterward passed into *Attica* at the head of a body of *Thracians*, to assist the *Eleusinians* in their war against *Erechtheus*, King of Athens. E. and his sons are said to have been slain in battle. He is spoken of as the founder of the *Eleusinian* mysteries. A distinction is made by some of the ancient writers between this E. and a son of *Musæus* bearing the same name. The latter is represented as a scholar of *Orpheus*, and the instructor of *Hercules*; but E.'s history, like all mythological stories, is involved in great obscurity and confusion. The name of E. is one of the series of those old priestly singers who, by the institution of religious ceremonies, spread culture and morality among the rude inhabitants of *Hellas*. An illustrious Athenian family, the *Eumolpidæ*, derived their descent from E., and held the office of priests of *Demeter* in *Eleusis*.

EUNICE, n. *û-nî'sê* [Gr. *Eunikê*, Eunice, Gr. female proper name; *eu*, well, good; *nikê*, conquest, victory]: in

EUNICIDÆ—EUOMPHALUS.

zool., typical genus of the family *Eunicidæ* or the tribe *Euniceæ*. *Eunice gigantea*, is a sea-centipede, sometimes as long as four ft., and consisting of above 400 rings. It is found in the ocean adjacent to the W. Indies.

EUNICIDÆ, n. *ū-nīs'ī dē*, or EUNIC'Æ, n. *-ē-ē'* in *zool.*, family or tribe of errant annelids with large branchial tufts, and from seven to nine toothed jaws.

EUNOMIUS, *ū-nō'mī-ūs*: b. in the village of Dacora, Cappadocia; d. 394: founder of the Arian sect of Eunomians. He was first a lawyer, then a soldier, ultimately took holy orders, and in 360 was appointed bp. of Cyzicum. In the great controversy in the 4th c. regarding the Trinity, E. was conspicuous by his advocacy of the view that the Father alone was eternal and supreme; that the Son was generated of Him; and the Holy Spirit, again, of the Son. His doctrine of the Trinity is sometimes called the *Anomoian* ('dissimilar'), to distinguish it, on the one hand, from the *Homoiousian* ('similar'), held by the semi-Arians, and, on the other, from the *Homoousian* ('identical'), held by the Athanasian or Trinitarian party. It was thus the extreme of Arianism, now known as the Unitarian view. In defense of his peculiar views, E. is said to have shown superior ability, though his opponents accuse him of being verbose and inflated in his style. His life was much checkered. He was banished from one place to another, until at length he obtained permission to retire to his native village, where he died. His writings have entirely perished, with the exception of a fragment here and there preserved in the writings of his adversaries.

EUNUCH, n. *ū'nūk* [Gr. *eunouchos*, one who is castrated—from *eunē*, a bed; *ēchō*, I have or keep: L. *eunūchus*; It. *eunuco*; F. *eunuque*, a eunuch]: the barbarous practice of employing castrated males as guardians of the other sex, is an accompaniment of polygamy, therefore found chiefly in the East and in n. Africa. When it has appeared in countries where monogamy was the law, it was in consequence of the introduction of oriental luxury, as under the Roman emperors. The practice is of great antiquity, and seems to have originated in Libya, and from that to have spread to Egypt and the East. Syria and Asia Minor were the most notorious in this respect. In Greece, it never obtained prevalence; for though Greek women were kept in seclusion, polygamy itself never prevailed. The later Romans kept eunuchs, but they were mostly imported. In the Byzantine empire, on the contrary, castration and keeping of eunuchs, were very prevalent. This class were prominent in the court of the Eastern Empire, and the word E. came to be the title of an office similar to that of chamberlain. In modern times, the practice is confined mostly to Mohammedan countries, and the eunuchs are brought chiefly as slaves from the interior of Africa. EU'NUCHATE, v. *-āt*, to make a eunuch. EU'NUCHATING, imp. EU'NUCHATED, pp. EU'NUCHISM, n. *-izm*, the state of a eunuch.

EUOMPHALUS, n. *ū-ōm'fā-lūs* [Gr. *eu*, well; *ōmphālōs*,

EUONYMUS—EUPATORIUM.

the navel, the boss of a shield]: large genus of fossil gastropodous shells, characterized by its depressed and discoidal shell, with angled or coronated whorls, five-sided mouth, and very large umbilicus. The operculum was shelly, round, and multi-spiral. The genus seems related to *Trochus*. It appears among the earliest tenants of the



Euomphalus Discors.

globe, and keeps its place till the Triassic period. No less than 80 species have been described. The figure represents one from the Wenlock limestone.

EUONYMUS, n. *ū-ōn'ī-mūs* [L. *Euonymus*; Gr. *Eunomia*, mother of the Furies, in allusion to the poisonous character of the berries]: spindle-tree; genus of trees, order *Celastraceæ*. About forty species are known. **EUONYMÆÆ**, n. *-ō-nīm'ē-ē*, tribe of *Celastraceæ*, having capsular fruit. See **SPINDLE TREE**.

EUOSMITE, n. *ū-ōs'mīt* [Gr. *eu*, well; *osmē*, odor]: a fossil resin, so called from its strong, peculiar, and pleasant odor.

EUOTOMOUS, a. *ū-ōt'o-mūs* [Gr. *eu*, well; *temnō*, I cut]: in *mineral.*, cleaving readily; having distinct cleavages.

EUPATORIA, *ū-pā-tō'rē-ā*, (formerly *Koslov*): thriving maritime town of Russia, govt. of Taurida; on a bay in the w. coast of the Crimea, 15 m. n.w. of Old Fort, 40 m. n.w. of Simferopol. The town stands on the border of a monotonous pastoral steppe, and is surrounded by low hills. Seen from the sea, it presents, with its occasional minarets and its houses roofed with red tiles, a picturesque appearance. The principal building is the Tartar mosque, built by Devlet-Ghiri Khan 1552, and reckoned the finest in the Crimea. E. exports corn, wool, and salt. Its harbor is shallow, sheltered only from the n. and n.e. winds. The people, mostly Crim-Tartars and Jews, are engaged chiefly as farmers and shepherds, and possess an immense number of oxen and sheep, and a large area of badly cultivated land. Pop. est. 13,416.

EUPATORIUM, *ū-pā-tō'rī-ūm*: genus of plants of the nat. ord. *Compositæ*, sub-order *Corymbiferaæ*, having small flowers (heads of flowers) in corymbs, florets all tubular and hermaphrodite, club-shaped stigmas, imbricated bracts, a naked receptacle, and a hairy pappus. The species are numerous, and mostly American.—**THOROUGH-WORT** (*E. perfoliatum*), a species having the opposite leaves joined at

EUPATRID—EUPEN.

the base, is very common in low grounds in N. America, and is a popular medicine, much esteemed and used. It is often administered in intermittent fevers. It acts powerfully as a sudorific, and is very beneficial in catarrh and influenza. It is also emetic and purgative, and, in small doses, tonic. The whole plant is very bitter.—Other N. American species have similar properties, and the



Hemp Agrimony (*Eupatorium cannabinum*): a, a floret.

root of one, GRAVEL-ROOT (*E. purpureum*), is employed as a diuretic for relief of the disease from which it derives its name.—The AYAPANA (*E. Ayapana*), a half-shrubby species, native of the n. of Brazil, has high reputation in that country as a cure for snake-bites, and has been introduced into the E. Indies. It is a very powerful sudorific, and is also diuretic.—The famous Peruvian vulnerary, MATICO, has been referred, but uncertainly, to a shrubby species of this genus, *E. glutinosum*.—GUACO or HUACO, much valued in Peru as a cure for snake-bites, is supposed to belong to the allied genus *Mikania*. See AGRIMONY.

EUPATRID, n. *ū-pāt'rid* [Gr. *eupatrides*, of a good or noble father, of noble birth; *eu*, well, good; *patēr*, a father]: in *Gr. antiq.*, a member of the *Eupatride*, or aristocracy of Athens, in whom was vested the whole power of the state. EUPATRIDÆ, n. *-rī-dē*, plural of Eupatrid.

EUPEN, *oy'pēn*: flourishing manufacturing town of Rhenish Prussia in a beautiful valley on the Weeze, within 2 m. of the Belgian frontier, 9 m. s.s.w. of Aix-la-Chapelle. It is well built and open, including within its limits several gardens and meadows. There are four churches—three Rom. Cath., one Prot., also a convent, a high-school, and an orphan-house. E. has the most flourishing woolen manufactures of any town in Prussia, and has also dye-work machine-making, and

EUPEPSY—EUPHORBIA.

other manufactures. It owes the prosperity of its manufactures chiefly to a number of French refugees, who settled here after the peace of Lunéville. Pop. (1880) 15,033; (1890) 15,445.

EUPEPSY, n. *ū-pěp'si* [Gr. *eu*, well; *peptō*, I cook, I digest]: good digestion. **EUPEP'TIC**, a. *-tik*, pertaining to.

EUPHEMA, n. *ū-fē'ma* [Gr. *euphēmos*, auspicious; *eu*, well, good; *phēmē*, fame]: in *ornith.*, a genus of *Psittacidae*, sub-family *Pezoporinae* (parrakeets, or parroquets). It contains some of the beautiful little grass parrakeets of Australia.

EUPHEMISM, n. *ū-fēm-izm* [Gr. *euphēmismos* for *euphēmia*, the use of words of good omen—from *eu*, well; *phēmi*, I speak: F. *euphémisme*]: substitution of a delicate or indirect expression in order to avoid something offensive to good manners, or indelicate; a mild name for something offensive. **EUPHEMIS'TIC**, a. *-is'tik*, rendering less offensive or more delicate.

EUPHON, *ūfon*, or **EUPHONON**, *ūfo-nōn*: musical instrument invented by Chladni 1790; its tone, like that of the harmonica, is produced from the sounding body by the finger direct, without mechanism, and is regulated in quality and effect by the taste and feelings of the performer, who can produce tones from the most delicate pianissimo to fortissimo. In 1822, Chladni exhibited an improved E., of which a detailed description is given by himself in the Leipsic *Musik-zeitung* of that year, page 805.

EUPHONIA, n. *ū-fō'nī-a* [Gr. *euphōnia*, symphony; *eu*, well, good; *phōnē*, sound, voice]: in *mus.*, sweet sound; a consonant combination of sounds; in *ornith.*, a genus of *Fringillidae*, sub-family *Tanagrinae* (tanagers). *E. musica* is the organist tanager of the W. Indies, a small bird which sings well. The plumage of the male is mostly black and orange. **EUPHONIAD**, n. *ū-fō'nī-ād*, in *mus.*, instrument in which are combined the characteristic tones of the organ and other instruments. **EUPHONIUM**, n. *-ūm* [Gr. *euphōnos*, harmonious or pleasant in sound]: in *mus.*, brass bass instrument, properly belonging to a military band, but frequently introduced into the orchestra as a substitute for the third or bass trombone, to the tone of which the sound of the euphonium has not the slightest affinity.

EUPHONY, n. *ū-fō'nī* [Gr. *euphōnīā*, euphony—from *eu*, well; *phōnē*, a voice: F. *euphonie*]: an agreeable sound of words; a pronunciation of words or syllables pleasing to the ear. **EUPHON'IC**, a. *-fōn'ik*, or **EUPHON'ICAL**, a. *-i-kāl*, agreeable in sound. **EUPHO'NIUS**, a. *-fō'nī-ūs*, pleasing to the ear. **EUPHO'NIUSLY**, ad. *-lī*. **EUPHONIZE**, v. *ū-fō-nīz*, to render agreeable in sound. **EUPHONIZING**, imp. **EUPHONIZED**, pp. *-nīz*. **EUPHONICON**, n. *ū-fōn'ī-kōn*, an improved pianoforte; also **EUPHONON**, n. *fo-nōn*.

EUPHORBIA, n. plu. *ū-fūr'bī-ā* [Gr. *euphōrbīōn*, a certain gum-resin—from *Euphorbos*, an anc. Greek physician]: genus of plants of many species, yielding an acrid milky juice, ord. *Euphorbiaceæ*. **OIL OF EUPHORBIA**, or **OIL OF**

EUPHORBIA.

CAPER SPURGE, an extremely acrid fixed oil, obtained by expression, or by the aid of alcohol or ether, from the seeds of the Caper Spurge (*Euphorbia Lathyris*), a plant common in many parts of Europe: see SPURGE. Oil of euphorbia has much resemblance to croton oil in its properties, though less powerful, and is sometimes used as a substitute for it, in doses of from three to ten drops. It is good for use only when recently extracted. EUPHORBIA'CEÆ, n. -bî-û'cê-ê, very extensive nat. ord. of oxogenous plants, con-



Caper Spurge (*Euphorbia Lathyris*).

taining more than 2,500 known species—trees, shrubs, and herbaceous plants. They abound chiefly in warm countries, most of all in tropical America. The few species found in the colder parts of the world all are herbaceous. The common Box reaches a more northern limit than any other shrubby species. The Euphorbiaceæ usually abound in an acrid and poisonous milky juice; though there are species of which the juice is bland or becomes bland through the application of heat, so that their leaves may be used as food. The leaves in this order exhibit great diversities. The inflorescence also is various. Among those most remarkable for acridity of juice are the MANCHINEEL (q.v.) and *Excoecaria agallocha*, an E. Indian tree—formerly supposed to yield one of the kinds of aloes-wood—the smoke from the burning of which is extremely dangerous to the eyes. The juice also of many of the spurges is very acrid. Many Euphorbiaceæ are valued for their medicinal properties, different parts of the plant being in some instances used, and in some the resins and oils which they yield. Thus the juice of some of the spurges, the roots or bark of the roots of others, the bark of different species of *Croton* (Cascarilla Bark, Copalche Bark), etc., are used in medicine; and to plants of this order we are indebted for euphorbium, oil of euphorbia-castor oil, croton oil, etc. A few Euphorbiaceæ yield balsami-

EUPHRANOR—EUPHRASY.

products of exquisite fragrance (see CROTON); a few, though their juice is poisonous, yield a wholesome starch in considerable abundance (see MANIOC); a few are cultivated and used as pot-herbs, particularly species of *Plukenetia* in the E. Indies; a few yield wholesome and agreeable sub-acid fruits, as *Cicca disticha* and *C. racemosa* in the E. Indies; the seeds of some are eatable, as those of the Candle-nut (q.v.), of *Omphalea diandra*, a Jamaica tree, and of *Conceveiba Guianensis*, the latter being esteemed particularly delicious; the oil of the seeds also is in some cases used for food, like other bland oils (see CANDLE-NUT); but it is used more frequently for burning, as castor oil, candle-nut oil, the oil of *Eleococca verrucosa* in Japan and Mauritius, and the concrete oil of *Stillingia sebifera*, used in China for making candles, and in medical preparations as a substitute for lard.—The dye-stuff called TURNSOLE (q.v.) is obtained from a plant of this order; and a bright red is imparted to silk by the roots of *Rottlera tinctoria*, native of Circassia, and by a red powder with which its seed-vessels are covered. The timber of some of the Euphorbiaceæ is valuable. African Teak (q.v.) belongs to this order. The red-colored wood of *Stylodiscus trifolius* is used in Java for making masts. Some Euphorbiaceæ are often cultivated in gardens and hot-houses, more for their curious appearance than for their beauty; but the large deep crimson bracts of *Poinsettia pulcherrima*, native of Madagascar, make it a very attractive plant. EUPHORBIUM, n. -bî-ûm, extremely acrid gum resin, obtained from several species of *Euphorbia* or SPURGE (q.v.) as *E. officinarum* and *E. antiquorum*, in n. Africa, Arabia, and the E. Indies; and *E. Canariensis* in the Canary Islands. It is obtained by incisions in the branches, whence issues a corrosive milky juice, which dries in the sun, and becomes a yellowish-gray waxy gum resin. The persons who collect it are obliged to defend their mouths and nostrils by a cloth, as its particles produce incessant sneezing, violent inflammation of the nostrils, and a very painful burning sensation in the mouth. On account of its excessive acidity, it is now less used in medicine than formerly; though it is still occasionally mixed with Burgundy pitch or other substances to make rubefacient plasters for chronic affections of the joints; its alcoholic tincture is used as a caustic in carious ulcers, and its powder, mixed with much starch or flour, as an *errhine* in chronic affections of the eyes, ears, or brain. It was formerly administered as an emetic and drastic purgative, but is dangerously violent in its action.

EUPHRANOR, ù-frā'nor: abt. B.C. 365–325; b. Corinth: Greek painter and sculptor. He is said to have been a pupil of Ariston, was contemporary with Apelles and Praxiteles, painted in encaustic and worked in marble and bronze, and produced, among other works commended by Plutarch and Pliny, *The Twelve Gods*, *The Battle of Mantinea*, and the *Feigned Insanity of Ulysses* in painting, and statues of *Paris*, *Valor*, and *Greece*.

EUPHRASY, n. ù'frä-sî, or EUPHRASIA [Gr. *euphrásiä*,

EUPHRATES—EUPHUISM.

delight]: the plant eye-bright, formerly supposed to be beneficial in diseases of the eyes; the *Euphrasia officinalis*, ord. *Scrophulārīacēæ*: see EYE-BRIGHT.

EUPHRATES, *ū-frā'tez* (in the oriental languages, *Frat*, *Phrat*, or *Forat*): largest river in w. Asia, forming with the Tigris, the most important river-system of that quarter of the world. It has its source in the heart of Armenia in two branches—the Kara Su and the Murad, of which the former rises 25 m. n.e. of the town of Erzerum, and flows s.w. to a point 10 m. n. of Keban' Ma'den, where it is met by the Murad, which rises on the s. slope of Alá Tagh, and flows w.s.w. to the point of confluence. From Keban' Ma'den, the E. flows in a general s. direction, with a tendency, however, to struggle westward toward the Mediterranean. In this part of its course, it breaks through the Taurus, and flows among the mountains for 45 m., emerging at Sumeisat, whence it continues navigable to the sea—a distance of 1,195 m.—and passing Bir, at which point it is 628 ft. above the level of the Mediterranean, and 100 m. distant from its nearest shore. After passing Samosta, it changes its direction, and flowing s., separates for a considerable distance Mesopotamia from Syria and the desert of Syrian Arabia. Curving s.e., it flows on, receiving scarcely any tributaries for about 700 m., until it is joined at Kurnah or Kornah by the waters of the Tigris. From Kurnah, the river, taking the name of the Shatt-el-Arab, continues in a s.e. direction, until, after being united by a canal with the Karun from the mountains of Persia, it empties by several arms, into the Persian gulf, 90 m. below Kurnah. The total length of the E. is 1,600 m.; area drained by all the waters which enter the Persian Gulf by the Shatt-el-Arab, 108,000 m. The average width of the Shatt-el-Arab is more than 600 ft.; it is navigable in mid-stream for vessels of 500 tons.—Various schemes have been proposed for an E. Valley railway, from the Mediterranean to the Persian Gulf, as an alternative route to India besides that of Suez.

The water of the E., though muddy, is not unwholesome. Its inundations, caused by the melting of the snows, are chiefly from the beginning of March, till the end of May; and in ancient times, when canals and embankments regulated these inundations, exercised the same beneficial effect on the country as those of the Nile on Egypt. See BABYLONIA.

EUPHROE, n. *ū-frō-ē* [etym. doubtful]: in *naut.*, long slat of wood, perforated for the passage of the awning-cords which suspend the ridge of an awning. The euphroe (or uphroe) and its pendent cords form a crow-foot.

EUPHROSUNE, *ū-frōs'ū-nē* (i.e., the joyous one): one of the Graces (q.v.).

EUPHUISM, n. *ū-fū-izm* [Gr. *euphūēs*, growing or increasing well, graceful—from *eu*, well; *phūē*, growth]: an expression affectedly refined; high-flown diction, with attempt at excessive elegance. **EUPHUIST**, n. *-ist*, one who

EUPHYLLITE—EUPODA.

uses such. EU'PHUIS'TIC, a. -*is'tik*, pertaining to. *Note*.—EUPHUISM properly took its origin from an extravagant and affectedly witty book by John Lyly (q.v.), in the reign of Elizabeth, which he called *Euphues*.

EUPHYLLITE, n. *ū-fil'it* [Gr. *euphyllon*, well leaved; *eu*, well; *phyllon*, a leaf]: transparent or translucent mineral, like mica, but splitting less easily; found in Delaware.

EUPION, *ū-pi-on* [Gr. *eu*, well; *piōn*, fat, well-fed]: extremely mobile oil, obtained from the lighter portions of the liquid products of the destructive distillation of wood (wood-tar), coal (coal-tar), and animal matter, and in the distillation of rape-seed oil. It may be obtained in a sufficient state of purity by acting upon the crude tars and oils by concentrated sulphuric acid, or a mixture of sulphuric acid and nitre, which removes the majority of the other ingredients; and on the distillation of the portion which resisted the action of the acid, the first part which passes over is the eupion. When pure, it has the composition C_6H_6 , and is therefore a hydro-carbon. It is the lightest liquid known, having the density of 655 (water = 1,000), and is thin, colorless, and tasteless, with pleasant aromatic odor. It boils at 116° F., and distils readily; and is very inflammable, burning with a white flame of considerable luminosity and penetrating power. It makes a greasy stain on paper, is insoluble in water, very slightly soluble in alcohol, but readily miscible with ethers and oils in general.

EUPLASTIC, a. *ū-plūs'tik* [Gr. *euplastos*, that can be easily molded; *plassō*, I mold, I form]: in *phys.*, having the capacity of becoming organizable in a high degree, as in false membranes, resulting from acute inflammation in a healthy person.

EUPLECTELLA, n. *ū-plēk-tēl'la* [mod. L., dimin. of Gr. *eupлектos*, well plaited, well twisted]: in *zool.*, Venus's Flower Basket, typical genus of *Euplectellidæ*, a family of siliceous sponges, section *Hexactinellidæ*.

EUPLEXOPTERA, n. *ū-plēks-ōp'tēr-a* [Gr. *eu*, well; *plexis*, plaiting, weaving; *ptera*, wings: so called because the posterior wings, which are membranous, are so elaborately folded, both longitudinally and transversely, as not to be adapted for flight]: in *entom.*, name given by Westwood to an order of insects containing but one family, the *Forficulidæ* or earwigs. Leach called them *Dermaptera*.

EUPLOTES, n. *ū-plō'tēs* [Gr. *euplōtos*, favorable to sailing; *eu*, well; *plōtos*, floating]: in *zool.*, typical genus of the family *Euplota*, a family of infusoria, founded by Ehrenberg. The body is surrounded by a carapace; there are two distinct alimentary orifices, neither of which is terminal. The locomotive organs consist of cilia, hooks, claws or styles. There are many species.

EUPODA, *ū'po-da* [Gr. well-footed]: family of coleopterous insects of the tetramerous section of the order; named from the great size of the hinder thighs of many of the species. They feed on the stems and leaves of plants.

EUPOLIS—EURE.

some of them on aquatic plants, the roots of which afford food to their larvæ. The body is oblong; the antennæ filiform. Some of the E. are among the most splendid of tropical insects.

EUPOLIS, *û'po-lis*: abt. B.C. 446-410; b. Athens: comic poet. He was author of numerous plays, some of which obtained the honors of triumph, and others satirized current political events and the manners and conduct of noted contemporaries, not even Alcibiades being spared. He was a rival of Aristophanes, and was thought by many critics to surpass him in purity and grace of diction. Several studies of his life, time, and works have been published, but only slight fragments of his comedies have been preserved.

EUPSAMMIA, n. *û-săm'mî-a* [Gr. *eu*, abundant; *psamos*, sand]: in *paleon.*, family of actinozoa, tribe *Perforata*. **EUPSAMMIDÆ**, n. *-dê*, in *zool.*, family of *Zoantharia Sclerodermata*, tribe *Perforata*; range in time from the Upper Silurian till now.

EUPYRCHROITE, n. *û-pîr-krō'it* [Gr. *eu*, well; *pur*, fire; *chrōs*, skin, complexion]: in *mineral.*, variety of apatite.

EUPYRION, n. *û-pîr'î-ôn* [Gr. *eu*, well, good; *pur*, fire]: contrivance for obtaining a light instantaneously, as a lucifer match, etc.

EURASIAN, n. *û-rā'zî-ăn* [contr. from *Europe* and *Asia*]: a cross-breed between a European and an Asiatic; denoting in India, chiefly the children by European fathers of Hindu mothers, and their descendants: **ADJ.** pertaining to both continents. **EURASIA**, n. *-zî ā*, sometimes used as a name for Europe and Asia conjoined.

EURE, *ûr*: river of the n.w. of France, tributary of the Seine. It rises in the dept. of Orne, flows first s.e. into the centre of the dept. of Eure-et-Loir, then n. and n.w. through the depts. of Eure-et-Loir and Eure, and joins the Seine on the left above Pont de l'Arche, after a course of about 100 m. Only the portion in the dept. of Eure is navigable.

EURE: department in the n.w. of France, immediately s. of the dept. of Seine Inférieure; 2,290 sq. m. Its surface is unusually level, as the highest eminences are not more than 300 ft. in height. The principal river is the Seine. The Eure, from which this dept. is named, and Rille, both affluents to the Seine, are the other important rivers. The climate is mild, moist, and foggy. Great part of the level country is covered with a loamy, alluvial soil upon a stratum of limestone; the remainder is of chalk, flint, and tufa. Along the Seine, the soil is in some parts sandy, stony, and barren, but the greater part is very fertile. The chief natural products are grain, hemp, flax, vegetables, and fruit, particularly apples and pears, from which large quantities of cider and perry are made. The breeding of cattle, horses, and sheep, is favored by extensive meadows and pasture-lands. Iron is found in considerable quantities. There are extensive iron and copper works and pin

EURE-ET-LOIR—EURETE.

manufactories. Cotton goods, cloth, linen, paper, glass, and stoneware are manufactured. The dept. is divided into five arrondissements—Evreux, Louviers, Les Andelys, Bernay, and Pont-Audemer. The cap. is Evreux (q.v.). Pop. of dept. (1881) 364,291; (1886) 358,829; (1891) 349,471.

EURE-ET-LOIR, *ūr-ā-loār'*: department of France formed chiefly from the province of Orléannais: between lat. 47° 57'—48° 55' n., and long. 0° 47'—2° e.; 2,260 sq. m. It is watered mainly by the Eure in the n. and the Loir in the s. This dept. lies on the water-shed between the Bay of Biscay and the English Channel. It is in general level, the e. and s. being occupied by high and extensive flats; while in the w. the scenery is finely varied by hill and valley. The soil is fertile and especially toward the e. and s. is admirably adapted for wheat. Hops grow spontaneously in some quarters. In the forests, the oak and birch are prevailing trees. The rivers, none navigable within the dept., furnish valuable water-power for numerous mills. Iron is the only mineral found and worked to any great extent; but the chief articles of trade are grain, flour, and wool. The dept. is divided into the four arrondissements of Chartres, Château-Dun, Dreux, and Nogent-le-Rotrou, with the town of Chartres for capital. Pop. of dept. (1881) 280,097; (1886) 283,719; (1891) 284,683.

EUREKA, n. *ūr-rē'kă* [Gr. *eurēkă*, I have found]: discovery made after long and difficult research—so called in allusion to the story of Archimedes, famous philosopher of Syracuse, who is said to have repeatedly uttered this word upon suddenly discovering a method of estimating the adulteration which King Hiero suspected that the goldsmith had made in his golden crown. The philosopher, whom the king had commissioned to test the crown, was stepping into his bath, and noticed that the water overflowed, being displaced in proportion to the bulk of the immersed object. Considering that gold is smaller than silver at equal weight, he inferred that the immersion of the crown would be a test of its alloy.

EUREKA, *ūr-rē'ka*: town, cap. of E. co., Nev.; on the E. and Palisade railroad, connecting with the Central Pacific railroad 90 m. n. It is 35 m. w.n.w. of Hamilton, 65 m. e. of Austin, about midway between Salt Lake City and San Francisco. It has 20 mining districts more or less tributary to its prosperity; is within three m. of the famous Ruby Hill and Prospect Mountain mines, and has several lead and silver smelting works, a private bank, money order post-office, three churches, and several schools. Pop. (1880) 4,207; (1890) 1,609.

EURETE, n. *ūr'ē-tē* [Gr. *eurētos*, easy to tell—from *eu*, easy; *rheō*, I tell]: typical genus of the family *Euretidae*, a family of hexactinellid sponges; range in time, from the Chalk till now.

EURIPIDES.

EURIPIDES, *ἑριπίδης*: latest of the three great Greek tragedians: probably B.C. 480, Sep. 23—406; b. Salamis, on the very day, it is said, of the glorious victory of the Greeks over the Persians near that island. (The Arundel Marble, however, gives as the date of his birth B.C. 485, while Müller, following Eratosthenes, makes it B.C. 489). His education was very good. At first, he was trained to gymnastic exercises (in consequence of the prediction of an oracle that he should be crowned with 'sacred garlands'); he turned his attention next to painting; then studied philosophy under Anaxagoras, and rhetoric under Prodicus, and formed a lasting friendship with Socrates. E.'s first play performed was the *Peliades* (B.C. 456). In B.C. 441, he gained the first prize for tragedy, and continued to write for the Athenian stage until B.C. 408, when he accepted an invitation to the court of Archelaus, King of Macedonia. Scandal has invented reasons unworthy of notice for E.'s leaving Athens. He is said to have been killed by dogs, set upon him by two brother-poets who envied his reputation. In E.'s time Greek tragedy had been brought to its highest point by Sophocles, who was 15 years older. E., however, was the second favorite author of his time; nay, on more than one occasion, his tragedies were preferred to those of Sophocles; but his liberal and even neologic tendencies in regard to religion excited the hostility of that witty but scurrilous champion of Greek orthodox paganism, Aristophanes, who frequently ridiculed E. in cutting parodies. There can be no doubt that E. was systematically abused by the Athenian tory party, of whom Aristophanes was literary chief, and to whose unscrupulous opposition it was owing that he gained the prize only five times out of 75 competitions. But against the censure of Aristophanes, may be set the praise of two much greater men—Aristotle and John Milton. E.'s plays are reckoned by some to have amounted to 75, by others to 92. Only 18 have come down to us. These are—*Alcestis* (B.C. 438), *Medea* (B.C. 431), *Hippolytus* (B.C. 428), *Hecuba* (B.C. 424), *Heracleida* (B.C. 421?), *Suppliants* (B.C. 421?), *Ion* (date not ascertainable), *Hercules Furens* (date not ascertainable), *Andromache* (B.C. 420–417), *Troades* (B.C. 415), *Electra* (B.C. 415–413), *Helena* (B.C. 412), *Iphigeneia in Tauris* (date uncertain), *Orestes* (B.C. 408), *Phænissæ* (probably same year), *Bacchæ* (written probably in Macedonia), *Iphigeneia in Aulis* (posthumously represented in Athens), and *Cyclops* (uncertain). *Rhesus*, attributed to E., is probably not genuine. Concerning E. and his tragedies, A. W. Schlegel remarks: 'Of few authors can so much good and evil be predicated with equal truth. He was a man of infinite talent, skilled in the most varied intellectual arts; but though abounding in brilliant and amiable qualities, he wanted the sublime earnestness and artistic skill which we admire in Æschylus and Sophocles. He aspires only to please, no matter by what means. For this reason, he is so frequently unequal to himself; producing at times passages of exquisite beauty, and frequently sinking into positive vulgarity.' The main object of E. was to excite emotion, and his works laid open a totally new world

EURIPUS—EUROPA.

(in literature), that of the heart, which beyond dispute, contributed much to their popularity. On the other hand, his inartistic and careless plots compelling him to a constant use of the *Deus ex machinâ* solution of difficulties, and occasionally even the subjects of his art themselves, leave ample room for criticism. Archelaus refused to allow his bones to be removed to Athens, and erected a splendid monument to him in Pella, with the inscription: 'Never, O Euripides, will thy memory be forgotten!' Still more honorable was the inscription on the cenotaph erected to him by the Athenians on the way to the Piræus: 'All Greece is the monument of Euripides; Macedonian earth covers but his bones.' Sophocles, who survived him, publicly lamented his loss; and the orator Lysurgus afterward erected a statue to him in the theatre at Athens. The *editio princeps* of *E.* appeared, it is thought, at Florence, toward the end of the 15th c. The best modern editions are: Beck (Leip. 1778-88), Matthiæ (Leip. 1813-29), Kirchhoff (1855), and Nauck (1871). An English translation in verse by Potter, appeared, Oxford, 1814.

EURIPUS: see CHALCIS: EUBCEÆ.

EURITE, n. *ū-rīt* [F. *eurite*: Gr. *eurītōs*, well or wide flowing]: a fine-grained white variety of felspathic granite; whistone. EURITIC, a. *-ik*, pertaining to. EURITIC-PORPHYRY, in *petrology*, a porphyry of which eurite is the basis, or which consists mainly of eurite. Lyell regards it as plutonic rather than volcanic.

EUROCLYDON, n. *ū-rōk'li-dōn* [Gr. *euros*, a s.e. wind; *klūdōn*, a wave]: tempestuous wind which prevails in the Mediterranean. In the account of the apostle Paul's shipwreck, Acts xxvii. 14, the name *E.* is now thought to be properly *Euraquilo*: the meaning is in some doubt; but probably the bitterly cold tempestuous wind, now called *Bora*, which sweeps over the Adriatic, similar to a *north-easter*.

EUROMERICAN, n. *ūr o-mēr'ī-kan* [a contraction of European and American]: in *ethn.*, term introduced by Wilson (to whom we owe also 'prehistoric'), to signify an American of European descent, as distinguished from the native inhabitants of America.

EUROPA, *ū-rō'pā*: in mythology, daughter of Agenor, King of Phœnicia, and Telephassa, and sister of Cadmus. Her extreme beauty enamored Jupiter, who, to engage her affections, assumed the shape of a bull and mingled with the herds of Agenor. *E.* caressed the animal, and in time had courage to mount his back, when he ran away with her, crossed the sea, and arriving in Crete, assumed his original shape and declared his love. Though under vows of perpetual celibacy, *E.* consented, and became mother of Minoas, Sarpedon, and Rhadamanthus. Subsequently she married Asterius, King of Crete, who, finding himself without children by her, adopted those by Jupiter. It has been supposed by some that the original of this myth lived about B.C. 1552. From the mythical *E.* the continent of Europe was named.

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EUROPE, *ū'rūp*: smallest and most highly civilized of the three great divisions of the old continent. It is separated from America on the w. and n.w. by the Atlantic; and from Africa on the s. by the Mediterranean; and from Asia by the Archipelago, Sea of Marmora, Black Sea, Caucasian ridge, Caspian Sea, Ural river and mountains, and the Kara river. It is in the form of a huge peninsula, projecting from the n.w. of Asia. Its extent from Cape St. Vincent on the s.w. to the mouth of the Kara river on the n.e. is 3,400 m.; and from Cape Nordkun, the most northerly point of the Scandinavian mainland, to Cape Matapan, the southmost point of Greece, 2,400 m. The continent of E., irrespective of islands, lies within lat. $36^{\circ} 1'$ — $71^{\circ} 6'$ n., and long. $9^{\circ} 30'$ w.— $68^{\circ} 30'$ e.; area, estimated 3,367,000 sq. m., about a third of that of Africa, and a fourth of that of America. Pop. abt. 365,000,000; average, 108 to a sq. m. Its indented coast-line is more extensive in proportion to its size than any other great natural division of the globe, and is estimated not less than 50,000 m. This is caused by its great irregularity, and the number of deep inlets and gulfs which penetrate its surface.

The body of the European continent divides itself naturally into two great portions—the great plain in the n.e., and the Highlands in the s.w.—the mountainous peninsula of Scandinavia lying apart from either, being in some sense exceptional. The plain occupies about two-thirds (2,500,000 sq. m.) of the entire extent of the continent. It reaches from the e. boundary of E., n. to the Arctic Ocean, s. to Mount Caucasus and the Black Sea, and w. over the whole extent of the continent; gradually, however, becoming narrower in its progress west. In shape, this plain resembles a triangle; its base rests on the e. boundary, and it may be said to reach its apex on the shores of Holland. It separates the two mountain systems of E.—the Scandinavian system (see SCANDINAVIA) on the n., and on the s. the system of s. Europe. The mass of the Alps, covering nearly 100,000 sq. m., forms the centre of the mountain system of s. and w. E., and stretches down on four sides toward France, Germany, Hungary, and Italy. The lowland plain, next Asia, lying e., is low, interspersed with woods and marshes, and cultivated land. See ALPS: APENNINES: BALKAN: CARPATHIAN MOUNTAINS: CEVENNES: PYRENEES: etc.

E. is surrounded by water on three sides. The White Sea comes in from the Arctic Ocean; the German Ocean and the Mediterranean from the Atlantic. The most important peninsula in the n. is Scandinavia, and in the s. are the Crimea, Turkey and Greece, Italy, and Spain. With the exception of Iceland, the islands cluster closely round the mainland, the chief being Great Britain and Ireland, Iceland, Seeland, Corsica, Sardinia, and Crete (Candia). The lakes of E. are small as compared with those of Africa or America. The Volga and the Danube are the largest rivers.

For details of the geography of E., see the titles of its

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several political divisions, and of its lakes, rivers, and mountains.

In respect of climate, far the greater portion of E. belongs to the n. section of the temperate zone, though parts of Norway, Sweden, and Russia lie within the Arctic Circle. The s. parts of Spain, Sicily, and Greece are abt. 12 degrees from the n. tropic. (See RAINFALL: TERRESTRIAL TEMPERATURE).

The European races belong in the main to the various branches of the great Aryan stock (see ARYANS: ETHNOLOGY), though in few European countries is there a pure race—the admixture of races being in some cases very great and close. But generally speaking, Celtic blood is found most largely in France (especially in Brittany where a Celtic tongue is still spoken), and a part of Great Britain and Ireland; Germanic people occupy Germany, Switzerland, Netherlands, part of Belgium, part of Austria, Denmark, Norway and Sweden, Iceland, and Great Britain. Slavonic races are found in Austria, Prussia, Turkey, and Russia (see SLAVONIANS). Romanic blood and language are prominent in Italy, France, Spain, and Portugal, and perhaps Roumania—but language is not always a true test of race. The Greeks belong to the same Greco-Italian branch as the Italians. Non-Aryan peoples are the Finns, Lapps, and Samoieds of the n. and n.e.; various Turanian tribes in the e. of Russia; the Hungarians and the Turks, and the Basques of the Pyrenees, also are non-Aryan; and a strong element of pre-Aryan blood is to be traced also in other parts of w. Europe, as Ireland and Britain. See titles of the various races and countries.

The table on the next page gives a comparative view of the states of Europe, their areas, and populations. In almost all except Russia and Turkey, the populations are given according to actual censuses 1878–81. For details as to the states composing the German empire, see GERMANY; for the constituent parts of the Austro-Hungarian monarchy, and of the joint kingdoms of Sweden and Norway, see the several titles. For the relation of Turkey to Bulgaria, Eastern Roumelia, Bosnia, and Herzegovina (the latter three being here included within its boundaries), see those titles.

Geology.—For the geology of E., see the different countries: also ALPS: PYRENEES: ETC.

Natural History.—The natural history of E. very much agrees with that of the corresponding latitudes of Asia. The natural history of the European countries on the Mediterranean Sea is very similar to that of Syria and of Asia Minor. The natural history of the more northern regions of E. resembles that of the great plains of Central Asia and Siberia. The most northern regions have the strictly arctic flora and fauna common in a great measure to all the arctic and subarctic regions; while the natural history of the most southern countries assumes a sub-tropical character. The European countries near the Mediterranean produce fewer of the shrubby and odoriferous *Labiata* than the Caucasus and adjoining regions, while the *Caryophyllaceæ* are more abundant. The extreme abundance of *Cistaceæ* is

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States.	Form of Government.	Extent in English sq. miles.	Population.	Number of inhabitants per English sq. mile.	Census Year.
Andorra	Republic, with a sovereign council.....	175	6,000	34	(1890)
Austria-Hungary.....	Limited monarchy, 2 chambers for each country.....	240,942	41,358,886	171	(1890)
Belgium	Limited monarchy, two chambers.....	11,373	6,341,958*	557	(1894)
Bosnia, Herzégovina, etc.....	Provinces occupied by Austria-Hungary.....	23,262	1,568,092	67	(1895)
Bulgaria and E. Roumelia.....	Principality under Turkey.....	37,860	3,309,816	85	(1893)
Denmark.....	Limited monarchy, two chambers.....	15,289	2,185,335	143	(1890)
France	Republic, two chambers.....	204,092	38,343,192	188	(1891)
Germany.....	Limited monarchy, two chambers.....	208,670	52,244,503	250	(1895)
Great Britain and Ireland.....	Limited monarchy, one chamber.....	120,979	38,104,875	315	(1891)
Greece.....	Limited monarchy, two chambers.....	25,041	2,187,208	87	(1889)
Italy.....	Limited monarchy, two chambers.....	114,410	30,913,663	270	(1894)*
Luxemburg.....	Grand-duchy, Netherlands.....	998	211,088	212	(1890)
Monaco.....	Principality, one chamber.....	8	13,304	1663	(1890)
Montenegro.....	Limited monarchy (dependent), one chamber.....	3,630	200,000	55	(1890)*
Netherlands.....	Limited monarchy, two chambers.....	12,648	4,795,646	379	(1894)
Portugal.....	Limited monarchy, two chambers.....	34,038	5,082,247	149	(1890)
Roumania.....	Limited monarchy, two chambers.....	48,307	5,800,000	120	(1893)*
Russia (Europe).....	Absolute monarchy.....	2,095,504	102,627,094	47	(1892)
San Marino.....	Republic, sovereign council.....	32	8,200	256	(1891)*
Servia.....	Limited monarchy, two chambers.....	19,050	2,288,259	120	(1895)
Spain.....	Limited monarchy, two chambers.....	197,670	17,565,632	88	(1887)
Sweden and Norway:					
Sweden.....	} Limited monarchy, two chambers for each	172,876	1,873,183	28	(1894)
Norway.....	} country.....	124,445	2,000,917	16	(1891)
Switzerland.....	Republic, confederation, federal diet.....	15,976	2,986,648	187	(1894)
Turkey (Europe).....	Absolute sovereignty.....	65,909	4,786,545	73	(1885)

* Estimated.

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a peculiar feature of the flora of Spain and Portugal. The *Primulaceæ* are particularly plentiful in all the alpine regions of the s. of E., but this characteristic is in some measure shared by the Himalaya. In no other part of the world do umbelliferous and cruciferous plants form so large a proportion of the flora as in Europe.

The temperature of the w. and n. parts of E. being raised by the Gulf-stream and the winds from the great mass of dry and desert land in Africa above what is elsewhere found in similar latitudes, the flora and fauna exhibit a corresponding character, affected, however, by the great amount of moisture from the Atlantic Ocean; also to a still greater degree by the comparative uniformity of temperature which the proximity of the ocean produces. The effect of the last-mentioned causes is so great, that the northern limit of some plants is sooner reached on the shores of the Atlantic than in the more central parts of E., where the winters are much colder, and the average temperature of the year is lower. Of this the vine and maize are notable examples. Plants which require a mild winter will not grow in the n.—scarcely even in the centre of E.—but they advance along the w. coast under the influence of the maritime climate. Thus the myrtle—though not indigenous—grows even in the s. of England. Among plants, the date palm, and among animals a species of ape, are found in the s. of E. (the ape only on the Rock of Gibraltar); while some strictly African birds are frequent visitants, and many birds—as the cuckoo, swallow, etc.—are common to E. and Africa, inhabitants in summer even of far northern regions, and returning in winter to the warm south.

Of the plants now most commonly associated in our thoughts with the s. countries of E., may have probably been introduced from Africa, or the East. This seems to have been the case even with the myrtle, and certainly has been with the vine, the olive, the orange, lemon, etc., the fig, the peach, the almond, the apricot, etc. Some of the most extensively cultivated fruits are certainly indigenous to E., as the apple, pear, plum, and cherry, although even of these the first improved varieties may have been introduced from the earlier seats of civilization in the East. Among the wild animals of E. at the present day, the aurochs (bison) is still reckoned; and the ox existed wild at no very remote period. The reindeer inhabits the extreme n. of E.; the elk, the stag, the fallow-deer, and the roebuck, are found in more southern regions; the ibex or bouquetin exists on the high central mountains; two species of antelope—the chamois of the Alps, and the saiga of the Russian plains—connect the European fauna with the Asiatic and African. Of carnivorous animals, the most noticeable are the bear, the wolf, the fox, and lynx.

The abundance of lakes and streams in the n. parts of E. is accompanied with a corresponding abundance of water-fowl (*Anatidæ*) and of fish. Of the latter, the *Salmonidæ* are most valuable, and the *Cyprinidæ* next. The European seas afford valuable fisheries, particularly of herring and of

EUROPEAN—EURYNOTUS.

cod in the n., and of tunny, anchovy, etc., in the Mediterranean.

The common hive bee and the Ligurian bee may be regarded as probably natives of Europe. The silk-worm was introduced from the East. Another valuable insect, the cochineal insect, was introduced from America; but the *Cantharis*, or blistering fly, is truly indigenous to the s. of Europe.

EUROPEAN, n. *ū-rō-pē'ān* [Gr. *eurus*, broad, and the root *op*, to see: comp. Gael. *Eu-ropach*, unravelled, unknown]: a native of Europe: **ADJ.** pertaining to. **EUROPEANIZE**, v. to naturalize in Europe; to adapt or accommodate to European manners, character, or usages.

EURYLE, n. *ūr-ī'a-lē* [L. *Euryale*, one of the Gorgons, from the thorny, menacing habit of the plant]: in *zool.*, genus of *Ophiuroidea*; typical of the family *Euryalidæ*. The arms are bifurcate. **EURYALIDÆ**, n. *ūr-ī-āl'ī-dē* [mod. L. *euryale*]: in *zool.*, Gorgon's head; family of *Ophiuroidea*. They have ten genital fissures, and branched arms and cirri like the dishevelled hair of the Gorgon; found in tropical seas.

EURYLE, *ūr-ī'a-lē*: genus of plants of the nat. ord. *Nymphæaceæ*, or Water-lilies, closely allied to *VICTORIA* (q. v.), though of very different appearance. *E. ferox* is a water-lily with small red or violet-colored flowers, leaves about 12 inches in diameter, the leaf-stalks and calyces covered with stiff prickles; native of India and China. The fruit is round, soft, pulpy, and of the size of a small orange, composed of a number of carpels, and containing round, black seeds as large as peas which are full of a nutritious, agreeable farina, and are eaten roasted. The root-stock contains starch, which may be separated and used for food; and the root itself is eaten. The plant is said to have been in cultivation in China for more than 3,000 years.

EURYDICE, n. *ūr-ī-dī'sē* [Gr.]: in *Gr. myth.*, the wife of Orpheus (q. v.); also the wife of Amyntas, King of Macedonia, and mother of Philip, the father of Alexander the Great.

EURLAIMINÆ, n. *ūr-ī-lū-mī'nē* [Gr. *eurus*, broad, large; *laimos*, throat]: broad-bills; sub-family of *Coraciidæ* (rollers). They have short, very broad bills, rather short wings, and strong feet, the outer toe connected for half its length to the middle one, the hinder toe long, the inner one the shortest of any. They inhabit the E. Indies and adjacent islands, suspending their nests, composed of small twigs, from the branches of trees overhanging water; type, *Eurylaimus*.

EURYNOME, n. *ūr-ī'n'o-mē* [Gr.]: in *Gr. myth.*, one of the Oceanides, who, together with Ophion, ruled over the world before Saturn and Rhea took possession of it.

EURYNOTUS, n. *ūr-ī-nō'tūs* [Gr. *eurus*, broad, ample; *notos*, the back]: in *geol.*, a genus of lepidoid fishes occurring in the carboniferous formation, having a high beam-like back. **EURYPTERUS**, n. *ūr-īp'ter-ūs*, or **EURYPTERIDÆ**

EURYTHMY—EUSEBIUS.

n. plu. -tēr'ī-dē [Gr. *ptērōn*, a wing or fin]: in *geol.*, a genus and family of extinct crustaceans, allied to the king-crab, so termed in allusion to their broad, oar-like swimming feet. **EURYP'TERITE**, **n.** -tēr-īt, any one of the eurypteris family, or any undetermined portion or specimen.

EURYTHMY, **n.** ū'rith-mī [Gr. *eurūthmīā*, complete harmony—from *eu*, well; *ruthmos*, rhyme, measure]: in *arch.*, the exact proportion between all parts of a building.

EUSEBIAN, **a.** ū-sē'bī-an [named after two bishops, *Eusebius* Pamphili, bp. of Cæsarea, often called the Father of Church History, and the bp. of Nicomedia, afterward of Constantinople. Both were intimate with Constantine the Great]: relating to either of the two Eusebiuses. **EUSEBIANS**, a semi-Arian sect, followers of the two Eusebiuses. They held that there was a subordination among the persons of the Godhead, and are hence by some technically called Subordinationists. They opposed Athanasius and supported Arius at the Council of Tyre, 335, and subsequently.

EUSEBIUS, ū-sē'bī-ūs, of Cæsarea, or **EUSEBIUS PAMPHILI**: father of ecclesiastical history: abt. 264—abt. 340; b. in Palestine. He took the surname of Pamphili from his friend Pamphilus, Bp. of Cæsarea, whom he faithfully attended for the two years (307–309) of his imprisonment during the persecution of Diocletian. He then went to Tyre, and afterward to Egypt, where he himself was thrown into prison on account of his religion. In 315, he succeeded Agapius as bp. of Cæsarea, and was prominent at the Council of Nice 327. E. was the head of the so-called semi-Arian, rather the moderate party in the Council of Nice. That party were averse to discussing the philosophy of the Trinity, and would have preferred the simplicity of Scripture language in speaking about the Godhead to the metaphysical distinctions of either side. They regarded Trinitarianism, on the one hand, as logically indefensible, but, on the other, they recognized the fact, that Scripture in many passages speaks of the Son in terms not compatible with the views of Arius; therefore they wished each man to have the utmost freedom in his interpretation of Scripture on this point. E. thought that the great thing was to lay to heart the truth, that 'God so loved the world that he gave his only begotten Son, that whosoever believeth on him should not perish, but have everlasting life.' The promise is to him that *believeth on the Son of God*, not, he argues, to him that *knows how the Son is generated from the Father*. He was very reluctant to accept the term *homoousios* (of the same substance), devised by Athanasius to describe the equality of the Son with the Father, and retained the kindest feelings toward Arius after the views of the latter were condemned. His moderation and other excellent qualities procured him the favor of Constantine, who declared he was fit to be the bishop of almost the whole world. E. has the reputation of being after Origen the most learned Father of the church. His chief works are—1. The *Chronicon*, a history of the world down to the celebration

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of Constantine's *Vicennalia* at Nicomedeia and Rôme, 327 and 328. It is valuable as containing extracts from such writers as Berosus, Sanchoniathon, Polyhistor, Cephalion, and Manetho. It was published in a complete state first by Mai and Zohrab, Milan 1818, from an Armenian ms. version discovered at Constantinople. 2. The *Præparatio Evangelica*, 15 books, a collection of such statements in old heathen authors as were fitted to make the mind regard the evidences of Christianity in a favorable light: it was translated into Latin, and appeared at Treviso 1480. The Greek text was published first at Paris 1544. 3. *Demonstratio Evangelica*, 20 books, intended to convince the Jews of the truth of Christianity from the evidence of their own Scriptures: a Latin version of this was printed as early as 1498; the Greek original did not appear till 1544, when it was published with the *Præparatio*, at Paris, by R. Stephens. 4. The *Ecclesiastical History*, 10 books: this relates the principal occurrences in the Christian Church till 324, and contains the results of E.'s studies in numerous libraries, and even in the imperial archives, Emperor Constantine having ordered, at E.'s request, an examination of all documents relative to the history of martyrs. One drawback of the work is, that E., on principle, withholds all account of the wickedness and dissensions of Christians, inasmuch as he did not consider such stories for the edification of the church. A Latin translation by Rufinus was published at Rome 1474; the Greek text at Paris 1549, and Geneva 1612. Among more recent editions are those of Heinichen (Leip. 1827) and Burton (Oxford 1838). The *Ecclesiastical History* has been translated into English, German, French, etc. Besides the foregoing works, may be mentioned the *De Martyribus Palestinæ*, a book against Hierocles; another against Marcellus; and a *Life of Constantine*. The first edition of all E.'s works appeared at Basel 1542.

EUSEBIUS, of Emisa: b. at Edessa, d. at Antioch 360. He studied at Alexandria, and was pupil of Eusebius Pamphili, and friend of Eusebius of Nicomedia. Averse to all theological controversies, he declined the bishopric of Alexandria, vacant by the deposition of Athanasius. He was afterward, bp. of Emisa, but during his ordination, a Christian mob, accusing him of 'mathematics' and magic, created a tumult, and compelled him to flee for his life. Subsequently, he returned to Emisa, where he was 'tolerated,' in spite of his dangerous knowledge. Emperor Constantius was much attached to E., and used to take him on his military expeditions. E. was accused of Sabellianism (q.v.), and Jerome calls him 'the ringleader of the Arian party.' Jerome, however, was rash in his epithets, and it is more probable that he belonged to the party of his namesake of Cæsarea, the Semi-Arians, or peace-party, who wished the doctrine of the Godhead expressed in the language of Scripture, and not of human theology. The homilies extant under his name have been published by Augusti (Elberf. 1829). The genuine ones show great eloquence.

EUSEBIUS—EUSTACHIUS.

EUSEBIUS, of Nicomedia, Patriarch of Constantinople: b. toward the end of the 3d c., d. 342. First he was tutor to Emperor Julian, to whom he was related by the mother's side; then bp. of Beryta (Beyrout), in Syria, and afterward of Nicomedia. In order to secure his position, he appeared as the defender of Arius at the Council of Nice, and afterward placed himself at the head of the Arian party. Under Emperor Constantine, whom he baptized 337, he became patriarch of Constantinople. In the year before his death he held an assembly of the church for the establishment of Arianism at Antioch. It is not easy to perceive his real character. We have no ecclesiastical works by Arian writers, our only sources of information as regards the character and opinions of that party being their enemies—the orthodox party; yet, making the ordinary allowance for partisanship, there seems reason for concluding that E. was cunning and double-tongued when occasion required, and imperious and violent when he had power in his hands. Athanasius considered him not the disciple, but rather the teacher of Arius. From him the Arians are sometimes styled Eusebians.

EUSKARIAN: term now often used for the Basque race (see **BASQUE PROVINCES**), especially in connection with the now prevalent theory, that peoples of this stock preceded the Aryans in w. Europe, and that even in England the Celts mingled with their Basque predecessors. Many ethnologists hold that in some parts of England, as s. Wales, the blood of the people is still mainly Euskarian.

EUSTACHIAN, a. *ū-stā kī-ăn* [after *Eustāchūs*, a celebrated Italian anatomist, A.D. 1574]: in *anat.*, applied to a tube or canal extending from behind the soft palate to the middle ear, to which it conveys the air (see **EAR**). **EUSTACHIAN VALVE**, a fold of the lining membrane of the heart: see **FŒTUS**.

EUSTACHIUS, *ūs-tā kī-ūs*, **BARTOLOMMEO**: Italian anatomist; b. in the early part of the 16th c., d. 1574. We learn that in 1562 he was prof. of medicine in the Collegio della Sapienza at Rome. His name is indelibly associated with anatomical science, through his discoveries of the tube in the auditory apparatus, and the valvular structure in the heart, which have been named from him. He was the first to give an accurate description of the thoracic duct, and probably the first to notice and describe the stapes (one of the chain of small bones crossing the tympanic cavity of the ear), a discovery which, however, Fallopius assigns to Ingrassias. He likewise contributed materially to the diffusion of more accurate knowledge regarding the development and evolution of the teeth, and the structure of the kidney. These discoveries are recorded in his *Opuscula Anatomica*, Venice 1563. He was the first anatomical writer who illustrated his works with good engravings on copper. The *Tabula Anatomice* which he was probably unable to publish in consequence of the poverty of which he complains in the introduction referred to, did not appear until 1714, when they were edited, with

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explanatory remarks, by Lancisi. Their value is evidenced by the fact, that Albinus published a new edition, with an excellent Latin commentary, Leyden, 1743; that Bonn published a Dutch edition, Amsterdam 1798; and that a German edition appeared 1800. Lauth, in his *History of Anatomical Discovery*, remarks that if the *Tabulæ* had appeared in E's. lifetime, anatomy would have attained its advancement in the 18th c., nearly 200 years earlier. E., Vesalius, and Fallopius may be regarded as the three founders of modern anatomy.

EUSTATHIAN, a. *û-stā'thī-an*: in *chh. hist.*, pertaining or relating to any of the bishops called Eustathius: N. a name given by the Arians to the Trinitarians who followed Eustace, Bishop of Antioch, about the date of the Nicene Council, 325; also the followers of Eustathius, Bp. of Sebaste, in Armenia, or another Eustathius, of whom nothing definite is known. The former was a semi-Arian, of strong puritanic and ascetic views, who went the length of prohibiting marriage. He was deposed by the Council of Melitena, 357, and that of Neo-Cæsarea 358. His followers were condemned by that of Nicopolis, 372..

EUSTATHIUS, *û-stā'thī-ûs*: Greek commentator on Homer and the geographer Dionysius; b. Constantinople, d. 1198. He was first a monk, then a deacon and teacher of rhetoric in his native city, and, 1155, was appointed abp. of Thessalonica, where he died. E. was profoundly versed in the ancient classic authors, and a man of prodigious acquirements, as is proved by his commentaries. The number of authors whom he quotes is almost incredible, and the value of his quotations is heightened by the consideration, that most of the works from which he extracts are no longer extant. His most important work is his *Commentary on the Iliad and Odyssey of Homer*. The first ed. appeared at Rome 1542-50; the last at Leip. 1825-29. The work is open to objection on the score of method, and is diffuse and digressive, but it is nevertheless a vast mine of knowledge for students of Homer. Of similar character is E.'s *Commentary on Dionysius*, printed first by Stephens (Paris 1547), and, lastly, in Bernhardt's edition of Dionysius (Leip. 1828). Of his commentary on the hymns of Pindar, only the *Proœmium* has come down to us. It was published first by Tafel 1832, with E.'s theological treatises and letters.

EUSTATHIUS, SAINT, Bishop of Berrhœa, Syria, Patriarch of Antioch: b. Side, Pamphylia. He opposed the Arians with extreme vigor in the Council of Nicæa, and was rewarded with the patriarchate of Antioch 325. Five years later the Arians, in a synod at Antioch, secured his deposition on charges of Sabellianism and unfaithfulness to his vows of celibacy; but the inhabitants arose in his defense, and by so doing provoked the emperor into banishing E. to Thrace. A work against Origen, and an address to the emperor, delivered in the Council of Nicæa, are his only extant writings.

EUSTATIUS, *û-stā'shē-ûs*, ST: one of the Dutch W.

EUSTIS—EUTERPE.

India Islands, near the n.e. bend of the great arch of the Antilles, about 12 m. n.w. of St. Christopher; lat. $17^{\circ} 31'$ n., and long. $63^{\circ} 5'$ w.; 8 sq. m. St. E. is a pyramidal rock of volcanic formation, showing two extinct craters, and still subject to earthquakes. Hurricanes also of intense severity occur, particularly in August and September. Along its entire circuit of 29 m., St. E. has only one landing-place which, besides being difficult of access, is strongly fortified. The whole mountain is fertile, producing in abundance not merely commercial crops, such as sugar, cotton, and tobacco, but also provisions of various kinds, such as maize, hogs, goats, and poultry. Pop. about 2,000.

EUSTIS, *us'tis*, WILLIAM, LL.D.: 1753, June 10—1825, Feb. 6; b. Cambridge, Mass.: physician. He graduated at Harvard Univ. 1772; studied medicine, and served through the revolutionary war as field and hospital surgeon; settled in Boston to practice; was surgeon of the expedition against Daniel Shays in the rebellion of 1786-7; member of the Mass. legislature 6 years, and of the council 2 years; member of congress 1800-05, and 1820-23; sec. of war 1809-12; U. S. minister to Holland 1814-18; and gov. of Mass. from 1823 till death. He received the degree LL.D. from Harvard Univ. 1823.

EUSTYLE, *n. ū'stīl* [Gr. *eustulos*, with goodly pillars, with pillars at the best distances; *eu*, well, good; *stulos*, a pillar, a column]: in *arch.*, that style of intercolumniation in which the space between the columns was two and a quarter times their diameter. So called from this being considered the most beautiful style.

EUTASSA, *n. ū-tās'sa* [Gr. *eu*, well; *tassō*, I arrange]: in *bot.*, *Eutassa excelsa*, better known as *Araucaria excelsa*, the huge Norfolk Island pine.

EUTAW SPRINGS, BATTLE OF: 1781, Sep. 8; near the Santee river, in S. C., 60 m. n.w. of Charleston; between 2,000 Americans under Gen. Greene, and 2,300 British troops under Col. Stuart. A reconnoitering detachment of British cavalry was first attacked and put to flight 4 miles from E. S. Gen. Greene then marched upon a body of infantry one mile from the British camp; drove them in and captured the camp; and while the Americans were plundering it, the British troops suddenly reformed and renewed the engagement, when Greene withdrew the Americans out of range, with a view of attacking the British on their retreat. Stuart, however, retreated toward Charleston at night, leaving Greene to occupy the field the next day. British loss, killed, wounded, and prisoners, 633; American loss, killed, wounded, and missing, 535.

EUTERPE, *n. ū-tēr'pē* [Gr. *eu*, well; *terpeîn*, to delight]: in *anc. myth.*, one of the nine Muses, daughter of Zeus and Mnemosyne. She was the Muse of lyric poetry, presided over wind instruments, and music generally, and is represented in ancient art with a flute in her hand: see **MUSES**. **EUTERPEAN**, *a. -pē-ăn*, pertaining to music.

EUTERPE, *ŭ-tēr'pē*: genus of palms, having male and

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female flowers intermingled on the same spadix, the spadices springing from beneath the leaves; the spathe entire, membranaceous, and deciduous. They are very elegant palms; with lofty, slender, smooth, faintly ringed stems; and pinnate leaves, forming a graceful, feathery plume; the bases of the leaf-stalks sheathing far down the stem, and so forming a thick column several ft. in length at its summit. To this genus the cabbage palm of the W. Indies, and the Assai palm of the banks of the Amazon, are often referred. See ARECA: ASSAI.

EUTHANASIA, n. *ū'thān-ā'zhī-ă*, or EUTHAN'ASY, n. *-ă-sī* [Gr. *euthanasia*, an easy death—from *eu*, well; *thānātos*, death]: an easy, happy death.

EUTROPHIC, n. *ū-trōf'ik*: in *path.*, agent which acts upon the nutritive system, without occasioning manifest increase of any of the secretions as a necessary consequence.

EUTROPHY, n. *ū-tro-fī* [Gr. *eu*, well, good; *trephō*, I nourish]: in *path.*, a healthy state of the nutritive organs; healthy nutrition.

EUTROPIUS, *ū-trō'pī-ūs*: Latin historian, concerning whom we know only that he was sec. to Emperor Constantine, fought against the Persians under Julian, and was still living in the reign of Valens. His *Breviarum Historiæ Romanæ*, a short narrative of Roman history from the foundation of the city to the time of Emperor Valens, is written in an extremely simple and pure style, and appears to have been intended originally for the use of schools. It became very popular as the taste for original investigation declined, in that dark period between the death of the old world and the birth of the new; and is either copied or followed by the early monkish annalists. An ed. with enlargements, however, was published by Paul, son of Warnefrid ud Theodolinda, generally known as Paulus Diaconus. Others continued it down to 813. The History existed in three distinct forms at the revival of letters: there was first the genuine work of E. in ten books; second, the expanded editions of Paul; and third, a very complete, but largely interpolated copy in the *Historia Miscellæ*. The *editio princeps*, Rome 1471, was from the impure text of Paul. The best editions in modern times are those of Tzschucke (Leip. 1796, improved 1804), and of Grosse (Halle 1813; Leip. 1825).

EUTYCHES: Byzantine ecclesiastic of the 5th c.; zealous but unskilful representative of the dogmatic opinions of Cyril of Alexandria. In opposing the doctrines of Nestorius, he fell into the opposite extreme, and taught that after the union of the two natures in Jesus Christ, the human nature was absorbed in the divine; an opinion which spread extensively through the Alexandrian Church. E. was in consequence summoned before a synod at Constantinople 448, and deposed by Flavianus, patriarch of that city; but his cause was warmly espoused by the eunuch Chrysaphius, chief minister of Emperor Theodosius II., and Dioscurus, Bp. of Alexandria—both opposed to Flavianus. Chrysaphius induced the emperor to call a general council at

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Ephesus in the following year, under the presidency of Dioscurus. Measures were taken beforehand to secure a triumph over the anti-Eutychians. Soldiers were admitted to the deliberations of the council, to overawe the party of Flavianus; while a crowd of fierce Egyptian monks, devotedly attached to whatever was popular in Alexandria, or had been countenanced by their old pupil Cyril, drowned by their fanatical outcries the voices of those who ventured to speak against Eutyches. See *EPHESUS, COUNCILS OF*. The result was that the judgment of the previous council was reversed; Flavianus and his adherents were deposed, and the doctrine of E. affirmed orthodox, and in accordance with the Nicene creed. His triumph, however, lasted only two years; in 451, Eutychianism was pronounced heresy at the Council of Chalcedon, attended by 650 bishops; and in opposition to his views, it was declared that in Christ the two natures were united without confusion or conversion of substance. Nothing further is known concerning E., except that Leo wrote to Emperor Marcian to banish him from the capital. The sect of Eutychians, however, under the name of Monophysites (q.v.) continued quietly for a century after his death, in the Armenian, Ethiopian, and Coptic churches, when it awoke to new life under the auspices of Jacob Baradaeus, who died bp. of Edessa, 588. His followers were called Jacobites, and have perpetuated the Monophysite doctrine in the Armenian and Coptic churches to the present day. See Neander, *Kirchengeschichte*, III., p. 1079, etc. *EUTYCHIANS*, n. plu. *ū-tik'ī-ānz*, heretics of the 5th c., followers of Eutyches: see *MONOPHYSITES*. *EUTYCHIANISM*, n. *ū-tik'ī-an-izm*, the doctrines of Eutyches; adherence to his doctrine.

EUXENIA, n. *ūks-ēn'ī-a* [Gr. *eu*, beautiful; *xenos*, a guest, a friend]: typical genus of *Euxenicea*, sub-tribe of *Senecionidea*. E. consists of two Chilian shrubs with aromatic leaves.

EUXINE, *ūks'īn* [Gr. *Euxinos*, hospitable]: ancient name of the Black Sea (q.v.). Before receiving this name it was called *Arenos Pontos*, the inhospitable sea, because of the black and turbulent weather so frequently ascribed to it by the ancient poets, and the reported cannibalism of the Scythian tribes who lined its n. shores. It seems to have been called the *Euxine*, or hospitable sea, after the establishment of Greek colonies on its borders, when its waters were thrown open to Greek commerce.

EUYUK, or *UYUK*: village of Asia Minor, 28 m. s. of the Kizil Irmak river, 75 m. w.s.w. of Amasia; on a small spur of a succession of high hills, ranging n. Though containing only a score of buildings, it is noted for its singular ruins, which have excited all manner of historical conjectures. The remains are those of a large edifice, and comprise blocks of granite of colossal size, which display with remarkable clearness a great variety of sculptures. The building resembles an Assyrian palace in form and divisions, with the upper part of its walls fashioned in clay. The most plausible conjectures are (1) that it was erected by

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artisans, who had been employed in building the palaces at Nineveh, and (2) that it was a temple, erected by Egyptians at the time of their earliest conquests in Asia Minor. If the former be true, the builders here adopted Egyptian figures and emblems, as they did elsewhere; if the latter, they added their own sphinx and human figure sculptures to the usual form of large Assyrian buildings.

EVACUATE, v. *ĕ-văk ū-ăt* [L. *evacuātus*, emptied out—from *e*, out of; *vacuūs*, empty: It. *evacuare*: F. *évacuer*]: to make empty; to quit; to eject or void; to empty; to withdraw from, as troops from a fortress. **EVACUATING**, imp. **EVACUATED**, pp. **EVACUATOR**, n. *-tēr*, one who, or that which. **EVACUATION**, n. *-ă'shŭn* [F.—L.]: an emptying; a retiring from; voidance; discharge of fæces from the body. **EVACUATIVE**, a. *-ă-tiv*, that evacuates. **EVACUANT**, a. [F.—L.]: emptying: N. a medicine used for producing evacuation.

EVADE, v. *ĕ-văd'* [F. *évider*, to evade, to escape—from L. *evādērē*, to go forth or out—from *e*, out of; *vādō*, I go: t. *evadere*—lit., to go forth or out]: to avoid or escape by artifice or dexterity; cleverly to escape from; to elude; to slip away; to equivocate. **EVA'DING**, imp. **EVA'DED**, pp. —**SYN.** of 'evade': to escape; shun; avoid; eschew; prevaricate; shuffle.

EVAGRIUS, *ĕ-văgrĭ-ŭs*: lawyer and historian: b. in Epiphania, Syria, 536. He practiced law in Antioch, became the legal adviser of Gregory, patriarch of that city, and defended him with such ability that he was appointed prefect of the city by the emperor. His influence and popularity were attested by a public festival in his honor on the occasion of his second marriage. He is known chiefly by his *Ecclesiastical History*, an extension of the histories of Socrates and Theodoret, in 6 books, covering the period 431–594. An edition was published by Reading (Cambridge 1720).

EVALUATION, n. *ĕ-văl' ū-ă'shŭn* [L. *e*, out of, and *valuation*]: exhaustive valuation.

EVANDER, *ĕ-văn'dēr*: semi-mythical Grecian hero of antiquity, according to Roman traditions, son of Hermes, by Carmenta or Tiburtis. About 60 years before the Trojan war, he is said to have led a Pelasgian colony from Pallantium, in Arcadia, to Italy, and to have landed on the banks of the Tiber, and near the foot of the Palatine Hill. Here he built a town, naming it Pallantium, after the one in Arcadia. At a later period, it was incorporated with Rome, and is affirmed to have originated the names Palatinus and Palatium. Tradition represented E. as having done much to introduce the habits of social life among his neighbors; he prescribed for them milder laws, and taught them, among other arts, those of music and writing. To him is ascribed also the introduction of the worship of the Lycean Pan, with that of Demeter, Poseidon and other deities. Virgil represents him as still alive when Æneas arrived in Latium after the sack of Troy. E. was worshipped at Pallantium in Arcadia, and at Rome.

EVANESCENT—EVANGELICAL.

EVANESCENT, a. *ěv'á-něs'ěnt* [L. *evanescēntem*, vanishing or passing away—from *e*, out of; *vanescō*, I vanish: F. *évanouir*, to vanish]: vanishing; fleeting; momentary; passing away. **EV'ANES'CENCE**, n. *-ěns*, the being liable to pass away; a vanishing; the act of passing away. **EV'ANES'CENTLY**, ad. *-ěnt-lǐ*. **EVANESCENTI**, prefix, *ěv-a-něs-sěn-tǐ* [L. *evanescens*]: evanescent. **EVANESCENTI-VENOSE**, a. *-vě'nōs*, in bot., having such a venation that the lateral veins disappear within the margin.

EVANGELIC, a. *ěv'án-jěl'ík*, or **EV'ANGEL'ICAL**, a. *-ǎ-kǎl* [F. *évangélique*—from L. *evangēlicus*—from Gr. *eu*, well, good; *anggelō*, I bring tidings, I announce]: according to the doctrines and precepts of the Gospel; orthodox. **EV'ANGEL'ICALLY**, ad. *-lǐ*. **EVANGELIZE**, v. *ě-ván-jěl'-iz*, to convert to Christianity; to instruct in the Gospel. **EV'ANGELI'ZING**, imp. **EVAN'GELIZED**, pp. *-ízd*. **EVAN'GELIZA'TION**, n. *-jěl'-i-zǎ'shún*, the act of converting to Christianity. **EVAN'GELIST**, n. one who brings good tidings; a preacher of the Gospel; one of the four Gospel writers. **EVAN'GELISM**, n. *-izm*, the spreading of the knowledge of the Gospel. **EVANGEL**, n. *ě-ván-jěl*, good news, especially that of the Gospel—used in poetry. **EVANGELY**, n. *ě-ván-jěl'-ǎ*, in *OE.*, good tidings; the Gospel message.

EVANGELICAL: adjective applied in general to anything which is marked by the spirit of the gospel of Jesus Christ; e.g. an evangelical sermon, evangelical piety, evangelical views, etc. The term 'evangelical,' however, is used by a large portion of the religious community to denote, not merely a spirit or sentiment resembling that of the Savior, but that spirit or sentiment viewed as resulting from, or as necessarily accompanied by, an assured belief in the grand facts of Christ's redemption. These facts, variously stated and with different emphasis on one or another point, are such as the universal sinfulness and peril of man; God's gracious redemption of man through the sacrifice of Christ, whose benefits are freely offered to all who will accept them by faith; the regenerating power of the spirit of God, given through Christ, to lead men into the new life of faith and love; a future of rewards and punishments unending, beyond the grave, to be rendered to every human soul, according to the just judgment of God. With these, is involved the acceptance of the authoritative revelation and binding precept of God as given in the Bible, and an acceptance of the scriptural revelation of the one God as the Father and the Son and the Holy Spirit. The word 'evangelical' has less strictness and smaller range of doctrine than 'orthodox,' while it involves more direct reference to character and life. 'Orthodoxy' may be said to include whatever doctrines are held to constitute the only true and complete expression of Christian belief. In England and Scotland, dissenters have generally laid claim to be considered more 'evangelical' than the national churches. In the Anglican Church, however, the rise of the Puseyite or Tractarian party has brought into prominence an antagonistic party, resembling dissen-

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ters very much in their theological tenets. This party calls itself, *par excellence*, 'Evangelical,' and has been criticised as expending much of its strength in antagonism to the ritual party and practices.—In Germany, all Protestants call themselves Evangelical, in opposition to Rom. Catholics, on the ground that the Reformers taught the pure gospel of the grace of God in Christ, cleansing it of all human corruptions. The modern orthodox or pietistic party in the German Prot. churches have of late made exclusive claim to the attribute Evangelical, on the ground that they alone hold to the gospel in its actual historical shape. This claim is naturally disputed by the 'liberal' theologians.—In a general doctrinal sense, 'Evangelical' is used in distinction from Rom. Catholic, Unitarian, and Universalist systems; but not as excluding such individual adherents of those systems as show an evangelical or gospel spirit.

EVANGELICAL ALLIANCE: association formed in London, 1846, Aug., to promote a more practical union among Protestants, a closer Christian fellowship, and a wider extension of the Christian faith. At the first meeting about 800 delegates were present, including many eminent men from Great Britain, France, Germany, Switzerland, and the United States; and representing Episcopal, Presbyterian, Congregational, Methodist, Baptist, Lutheran, Reformed, Moravian, and other churches. The following summary of doctrines, regarded as essential by those who form the alliance, was adopted: 1. The divine inspiration, authority, and sufficiency of the Holy Scriptures. 2. The right and duty of private judgment in the interpretation of the Scriptures. 3. The unity of the Godhead, and the trinity of persons therein. 4. The depravity of human nature in consequence of the fall. 5. The incarnation of the Son of God, his work of atonement for the sins of mankind, and his mediatorial intercession and reign. 6. The justification of the sinner by faith alone. 7. The work of the Holy Spirit in conversion and sanctification. 8. The immortality of the soul, the resurrection of the body, the judgment of the world by our Lord Jesus Christ, with the eternal blessedness of the righteous, and the eternal punishment of the wicked. Branch alliances have since been formed in Great Britain, Germany, France, Switzerland, Spain, Belgium, Holland, Italy, the United States, Australia, and among missionaries in Burmah, Siam, China, Ceylon, India, Turkey, Syria, Egypt, Africa, and other distant lands. These national branches have charge of the work in their respective countries; and delegates from them meeting together, form a Protestant 'ecumenical council,' which exercises only moral and spiritual power, to the exclusion of all ecclesiastical authority. These councils have been held at average intervals of 4 or 5 years. That at New York, 1873, Oct., remarkable as the first assemblage in the western hemisphere of Christians from all parts of the world, was attended by more than 500 delegates, many of whom were men very highly distinguished in

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church and state. For ten days, in the midst of large and enthusiastic congregations, they deliberated together on the religious condition of Christendom, Christian union, Christian life, and on Christianity in its relations to unbelief and error, to science, civil government, philanthropy, and the reform of social evils. At the close of the sessions, the council, by invitation, proceeded to Princeton, Philadelphia, and Washington; in all of which places highly interesting meetings were held. In 1887, Dec., the branch Alliance for the United States held, at Washington, D. C., a general conference, which was very largely attended by representative men of all Prot. denominations, who, during three days, earnestly and thoroughly considered the following topics: 1. The present perils of Christianity in the United States. 2. Its great opportunities. 3. The imperative need of the active co-operation of all Christian churches, and the best means for securing it. Some of the results of the E. A., already seen, are: 1. An increase of earnest and systematic work in evangelizing more thoroughly nominally Christian countries, and in establishing Christianity in heathen lands. 2. A growth among all denominations, of Christian fellowship, of co-operation in Christian work, and of effort to secure a more pronounced outward expression of Christian unity. 3. Successful endeavors to promote religious liberty in quarters where it is denied or threatened; for example, in Turkey, Japan, the Baltic provinces of Russia, and some parts of southern Europe.

EVANGELICAL ASSOCIATION (sometimes inaccurately called the German Methodist Church): a union of Christian churches, organized in 1800. The Rev. Jacob Albright (1759-1800, b. Penn.) of eastern Penn. began, about 1790, to preach among the Germans around him, in order to raise their standard of doctrinal belief and of moral conduct. He continued this work successfully for 10 years, gradually enlarging the range of his travels and the number of persons brought under his influence. At length, to meet the exigencies of the case, he gathered his scattered converts into little companies for mutual comfort and help. These were soon found to need some bond of union for edification and strength. A general meeting was therefore, called, to consider the best methods for promoting their welfare and work. The first thing done by the assembled people was to choose Mr. Albright as pastor and bishop; ordaining him to the ministry, and clothing him with authority over themselves, in subjection to the Scriptures as their only rule. Subsequently, they adopted a creed and form of church order, in accordance with their views of Scripture truth. The creed is described as steering between Calvinism and Arminianism; in church order, they resemble the Meth. Episc. Church, their ministers being itinerant, and having among them no higher order than that of 'elders.' As their numbers increased they organized annual conferences; and, since 1843 have held, every four years, a general conference of delegates from the annual conferences. They have presiding elders and bishops; both classes being elected for a term of four years,

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at the expiration of which, unless they are re-elected, their authority ceases. For the first 25 years they encountered many difficulties and great opposition; but, since that time, have had a prosperous course. Their membership is no longer confined as at first to German immigrants and their German-speaking descendants. As from the beginning they denounced slavery, they made progress only in the free states and Canada. They prosecute the work of missions at home and, to some extent, also abroad. They are friends of education, and sustain several literary institutions, among which is a college at Naperville, Ill. They forbid the use of intoxicating liquors as a beverage by their ministers and members; and exclude the dealers in them from church fellowship. In 1891 official reports showed 619 local and 1,227 itinerant preachers; 2,062½ churches; 150,234 members; 2,535 Sunday schools, with 28,613 officers and teachers, and 177,639 pupils; and church property worth \$6,041,268.

EVANGELICAL COUNSELS: in the Rom. Cath. Church, certain admonitions taken from the N. Test. and recommended for the observance of all who wish to attain a superior degree of holiness. They are classed as non-obligatory rules, in contra-distinction to the commandments and precepts (obedience to which is held to be an absolute necessity), and originally took the form of 3 vows: to renounce riches for voluntary poverty, pleasure for perfect chastity, and self-will and love of power for obedience to a religious superior. Subsequently the vows were increased to 12. (See Matt. v. 29, 35, 39, 42; xix. 11, 21; xxv. 21; Lk. xiv. 26; xvii. 10; I. Cor. vii. 10, 25; I. Tim. iv. 8.)

EVANGELICAL UNION: religious body constituted in Scotland 1843 by the Rev. James Morison of Kilmarnock (now Dr. Morison of Glasgow), and other three ministers (with their respective adherents), who had been separated from the United Secession Church for doctrinal views, of which the fundamental and determining article was the strict universality of the Savior's atonement. Coeval with the body is its Theological Academy, presided over by Dr. Morison, and attended by more than 20 students annually. They were soon joined by a number of ministers and churches of the Congregational Union of Scotland, and have since extended themselves considerably in Scotland and the n. of England. Their church government is congregational, though many congregations have ruling elders. Their doctrinal views are exhibited in an authorized publication, *Doctrinal Declaration*, 1858. See **MORISONIANISM**.

EVANGELIST: literally, bringer of good tidings, designates, in the New Testament, a person appointed by an apostle to itinerate among the heathen, and so prepare the way for resident Christian instructors. The evangelist, therefore, had no particular flock assigned to him, and is thus distinguished from bishops, or pastors, whether of larger or smaller territories. Later in the history of the early church, the evangelist figures, according to Eusebius, as 'a deliverer of the written gospels to those who were

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ignorant of the faith.' This may possibly imply that he acted as a colporteur, by distributing copies of the gospels, or that he read them to the heathen, and so made them familiar with their contents. In modern usage, E. has come to signify one of a class of revivalists, preaching zealously for a longer or shorter period in a place, often under direction of the local minister, sometimes independently, and aiming by pungent sermons and fervent appeals to bring to pass a multitude of immediate conversions. In the Church of England, and affiliated churches, these are known as *Missioners*, and have had great success in recent years. — The word evangelist is specially applied to the four writers of the life and gospel of Jesus Christ, these being evangelists ('bringers of good tidings') *par excellence*.

EVANGELISTS, SYMBOLS OF THE FOUR: symbols in sacred art. *Jointly*: 4 scrolls placed in the 4 angles of a Greek cross; 4 books (the Gospels); 4 rivers rising in Paradise; 4 beasts (Rev. iv. 7), typifying Christ's Incarnation, Passion, Resurrection, Ascension; the tetramorph, or union of the 4 attributes of the evangelists into a single winged figure; 4 human figures, but with animal heads, each holding an open book. *Separately*: MATTHEW: cherub; human figure, head in halo, carrying tax-collector's bag; human figure writing in a book from an angel's dictation; MARK: lion; lion flying with double wings, head in halo, fore-claws holding book; lion-head, human shoulders and arms holding book; wings; figure in pontificals of a Greek bp.; LUKE: ox; head of ox with wings; ox-head with wings flying between 5 stars; artist painting the Virgin's portrait; hooded figure seated on an ox and writing in a book; JOHN: eagle; eagle soaring with double wings, head in halo; human figure with eagle-head in halo; aged man, white hair; young man, beardless; human figure writing, devil stealing inkhorn; draped figure, pensive, bearing the sacramental cup from which a serpent is emerging.

EVANIA, n. *ĕ-vā'nî-a* [Gr. *evanios*, taking trouble easily; *eu*, easily; *ania*, grief, trouble]: typical genus of *Evaniidæ*, a family of hymenopterous insects, tribe *Entomophaga*. They have the abdomen attached to the upper surface of the meta-thorax, and the antennæ straight.

EVANISHMENT, n. *ĕ-vān'ish-mënt*: a vanishing or disappearing from sight; disappearance; evanescence.

EVANS, *ĕv'ans* or *ĕv'anz*, Lieutenant-General Sir DE LACY, G.C.B.: 1787–1870, Jan. 9; b. Moig, Ireland. He entered the British army as ensign 1807; in 1812, joined the 3d light dragoons, with whom he saw much Peninsular service. In 1814, he was brevet lieut. in the war with the United States. He was next at Waterloo. In 1830–1, he sat in parliament for Rye, and 1833 was elected on the liberal interest for Westminster, which he represented until 1841. The command of the British auxiliary legion in aid of the cause of the young queen of Spain, was offered to E., and he was allowed by his constituents to accept it without vacating his seat for Westminster. E.'s principal military ex-

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exploits at the head of the British Legion were the storm and capture of the Carlist lines of Ayetta, near St. Sebastian, 1836; the storm and capture of Irun; and the capture of Oyarzun and Fontarabia. E. was again in parliament for Westminster 1846-65; was promoted to the rank of major-general of the British army 1846, and obtained the colonelcy of the 21st foot 1853. On the declaration of war against Russia, he was appointed to command the second division of the army sent out to the Crimea, with the rank of lieutenant-general. In 1855, Feb., E. received the public thanks of the house of commons, for his services in the Crimea. He was rewarded by the crown with the grand cross of the Bath, and by the emperor of the French with the grand cordon of the Legion of Honor. He also received the degree D.C.L. from the Univ. of Oxford. In politics, he always belonged to the party of 'advanced liberals.'

EVANS, FREDERICK WILLIAM: elder in the Society of Shakers; b. Leominster, England, 1808, June 9. He was brought up on a farm, came to the United States with his father, 1820; learned the hatter's trade; taught himself to read, and studied the works of Owen, Fourier, and other advocates of social reform. After a brief visit to England, he joined the community of Shakers at Mount Lebanon, N. Y., 1850, June 3, and subsequently became assistant elder in the 'North Family' (1838), first elder of three 'families' (1858), and the leader of the sect in the United States. When he joined the community it comprised 600 members; afterward the membership fell off; but in 1888 it comprised 6 families with 400 members, was holding its own, and prospering. E. has lectured frequently on the dogmas of his sect, and published *Compendium of Principles, Rules, Doctrines, and Government of Shakers*, with biographies of early and leading Shakers (1859); *Autobiography of a Shaker*, and *Tests of Divine Revelation* (1869); *Shaker Communism* (1871); *Religious Communism* (1872), etc. He d. 1893, Mar. 6.

EVANS, MARIAN (*nom de plume*, 'George Eliot'): one of the greatest of English novelists, and probably the foremost literary woman of her age: 1820, Nov. 22—1880, Dec. 22; b. Griff, near Nuneaton; youngest daughter of a Warwickshire land-agent. Her education, begun at Coventry, embraced music, French, German, Italian, Greek, and Latin; Spanish and Hebrew were later acquisitions. Her translation of Strauss's *Leben Jesu*, published 1846, was her first literary effort. Her reading in history, science, speculative philosophy, and theology was very extensive; and when in 1851 she settled in London as assistant to Dr. Chapman, editor of the *Westminster Review*, Herbert Spencer has testified that she 'was already distinguished by that breadth of culture and universality of power which have since made her known to all the world.' Her translation of Feuerbach's *Essence of Christianity* appeared 1853. In 1856, G. H. Lewes forwarded to the Messrs. Blackwood the first instalment of *The Scenes of Clerical Life*, which appeared next year in *Blackwood's Magazine*

with the now familiar signature of 'George Eliot.' These proclaimed with great distinctness the advent of a new novelist of fresh and original power. It was from the first well understood that the signature was a mere *nom de plume*; and no little curiosity was excited as to the personality of the author unknown. That feeling was much deepened by the publication, 1858, of the novel of *Adam Bede*, which attained an immense success, and at once secured for the writer almost undisputed rank with the most eminent novelists of the day. This was followed, 1859, by *The Mill on the Floss*, which amply sustained the reputation of the writer; and, 1861, by *Silas Marner, the Weaver of Raveloe*, one volume. In 1863, *Romola*, an elaborate historical novel of Italian life, illustrating the times of Savonarola, was published in the *Cornhill Magazine*. This work has never had the popularity of its predecessors, but was considered by some the greatest effort of the author. It had by this time become certain that Miss E. was the 'George Eliot' of these works; and by not a few competent critics a place had been assigned her at the very summit of this branch of literature. *Felix Holt, the Radical*, published 1866, was almost everywhere received with acclamation. *Middlemarch, a Study of English Provincial Life*, published at intervals in 8 divisions, 1871-2, enhanced the author's great reputation. It has sometimes been spoken of as her chief triumph; though the palm is generally assigned to *Adam Bede*. *Daniel Deronda* was published at intervals in 1876. In its chief characters are sympathetically idealized the history, character, and aims of the Hebrew race—a unique and daring artistic conception. Of the poems, *The Spanish Gypsy* was published 1868; *Agatha*, 1869; *the Legend of Jubal*, 1870; and *Armgarth*, 1871. Meanwhile the distinguished authoress had for years been known to a wide circle of friends as the wife of George Henry Lewes (q.v.), who died 1878. In 1879 she published a vol. of essays, *The Impressions of Theophrastus Such*; another vol. of essays appeared 1884. In 1880 she married Mr. J. W. Cross. See her *Life*, drawn almost wholly from her letters and journals, by Mr. Cross (1885); and a short life by Miss Blind (1883). Her poems, though marked by many of the highest qualities of true poetry, have missed success. They and her novels, whether those founded on memories of English life in the Midland Counties, or the romances of pure historic imagination, have many qualities in common. 'George Eliot's' work is remarkable not only for nobility of tone, wealth of pregnant suggestion, and subtlety of insight, but for tenderness of feeling, keen sense of humor, delicacy of treatment, and width and variety of sympathy. Earnest purpose is manifest; but the lighter gifts of the novelist are used with grace and effect. The style is pure and forcible. The interest centres largely in character struggling with circumstance, sometimes succumbing to fate, and generally molded or modified by surroundings. Egoism is everywhere revealed as the great canker of life. 'George Eliot' had a keen sympathy with the ethical elements of the

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'Religion of Humanity;' her Positivist beliefs she does not obtrude on her readers. These beliefs, towards which she seems to have been tending since abt. 1829, were confirmed after 1851, during her assistant editorship of the *Westminster Review*, by her intimacy with Herbert Spencer, Mill, and others of that school. Her example has done much to forward the cause of woman's culture, and her personal character was genial.

EVANS, OLIVER: 1755-1819, Apr. 25; b. Newport, Del.: inventor. He learned the wheelwright's trade, invented a machine for making card teeth when 22 years old, became associated with his brothers in a flour-mill when 24, and within a few years devised improvements for his business, comprising an elevator, hopper, drill, and descender, which radically changed the process of manufacturing flour. As early as 1772 he began experimenting to produce a substitute for animal power in moving wagons, and in 1780 completed the first high-pressure steam engine in the United States. During 1803-4, he planned and built for the Philadelphia board of health, the first steam dredging machine used in the United States; and, by connecting his engine by pulleys and bands with four wooden wheels placed beneath the scow, and also with a paddle wheel behind it, was able to move his singular apparatus equally well over land and water. He thus became the originator of locomotion by steam power. He was desirous to build a railroad between Philadelphia and New York, but was prevented by lack of money.

EVANSTON, *év'anz-ton*: town of Cook co., Ill.; on Lake Michigan; on the Milwaukee division of the Chicago and Northwestern railroad; 12 m. n. of Chicago. It is delightfully situated and laid out, is lighted with gas and electricity, has the Holly system of waterworks, 6 churches, 1 private bank, 2 weekly newspapers, and numerous costly residences. It is the seat of the Northwestern Univ. (Meth. Episc.) founded 1854, largely endowed and of high repute, with a library of 25,000 vols. and a grand museum. It is the seat also of the Garrett Biblical Institute; and of the E. College for Ladies, founded 1871. A state law prohibits the sale of intoxicating beverages within 4 m. of the univ. buildings. Pop. (1890) 13,059.

EVANSVILLE, *év'anz-vil*: city, cap. of Vanderburg co., Ind.; on the O. river, 192 m. above Cairo and 185 m. above Louisville; on the Evansville and Terre Haute, Louisville Evansville and St. Louis, Louisville and Nashville, and Lake Erie and Southwestern railroads; a port of entry, and the second city in the state. It is on a high bank at a bend of the river, midway between the falls and its junction with the Mississippi; is the geographical centre of a rich and fertile agricultural region, accessible in every part by navigable streams, as well as by lines of railroad; and is in the midst of the great coal fields of the west and southwest; hence, it has unusual advantages as a manufacturing and shipping point. In 1890

EVAPOMETER—EVAPORATE.

it had 482 manufacturing establishments, which employed a capital of \$9,166,859, paid \$3,197,928 in wages to 7,435 hands, and yielded products valued at \$12,809,334. The principal industries were 7 stove and hollow-ware works, 5 engine and machine shops, 3 plow factories, 5 boiler yards, 14 sheet iron, tin, and copper works, 14 saw mills with extensive lumber yards doing annual business of \$1,500,000, 23 carriage and wagon factories, 17 furniture factories, 10 coopering houses with a capacity of 250,000 barrels per annum, 5 marble yards, 19 cigar factories, 5 brick-yards, 4 breweries, 3 malt-houses, 7 flour-mills, 6 tanneries, 3 soap-factories, 4 broom-factories, 16 saddlery shops, large woolen and cotton mills, 1 saw factory, and 1 fireproof safe factory. In 1888, there were 4 national banks, cap. \$1,450,000; 1 private bank and 1 savings-bank; U. S. custom-house and post-office, U. S. marine hospital, 2 theatres, several public halls, including one exclusively for temperance meetings and purposes, the Willard library and art gallery (endowment \$500,000), city hall, court-house, 3 libraries, and 5 daily and 5 weekly newspapers. There are 40 churches: Meth. Episc., 9; Bapt., 7; Presb., 5; Rom. Cath., 5; Lutheran, 3; Prot. Episc., 3; German Evang., 2; Jews, 2; Christian, German Evang. Assoc., Ref. Ch. in the U. S., Free Meth., each 1. There are also 15 public school buildings, including a high school for white pupils and another for colored, and 11 denominational schools. The public lands in the s.w of Indiana Terr., along the O. and Wabash rivers, were surveyed 1806-09. As soon as they were offered for sale, Col. Hugh McGary, of Ky., secured patents for a large tract that included the site of E., erected the first house on the banks of the O. 1812, and began clearing the land. Ind. was admitted into the Union 1816, Dec., and in the following spring Col. McGary sold half of his town site to Gen. Robert M. Evans and James W. Jones, by whom it was named E. It was incorporated as a town 1819. The first newspaper was started 1821, the first school opened 1834, and the first bank established 1834. A city charter was granted 1847. Pop. (1860), 11,484; (1870) 21,830; (1880) 29,280; (1890) 50,674.

EVAPOMETER: same as EVAPOROMETER.

EVAPORATE, *v.* *ě-văp'ō-răt* [*L. evāpōrātus*, dispersed in vapor—from *e*, out of; *vapōr*, vapor: *It. evaporare*: *F. évaporer*, to evaporate—*lit.*, to disperse in vapor]: to pass off in vapor or fumes; to dissipate in fumes; to give vent to; to pour out in words or sounds, not in action; to pass off without effect. EVAP'ORATING, *imp.* EVAPORATED, *pp.* EVAP'ORA'TION, *n.* *-ră'shŭn* [*F.—L.*]: the slow conversion of a fluid into vapor or steam, generally invisible; the state of flying off in fumes; vent. EVAP'ORABLE, *a.* *-ră-bl*, that may be converted into a vapor. EVAP'ORATIVE, *a.* *-ră-tiv*, causing evaporation. EVAP'OROM'ETER *n.* *-rŏm'-ě-tēr* [*Gr. metron*, a measure]: an instrument for measuring the quantity of fluid evaporated in a given time.

EVAPORATION.

EVAPORATION: conversion of a fluid or solid into vapor. Steam, vapors of alcohol, camphor, iodine, etc., are familiar instances. All fluids are surrounded by vapor at common temperatures; but for every substance there is a limiting temperature, below which no evaporation takes place. The pressure, or tension, of a vapor depends mainly on the nature of the substance evaporated, and the temperature to which it is raised. The full amount of vapor, however, is not produced instantaneously, and, therefore, in general, *time* is an element in the question as well as temperature. See **DIFFUSION**.

The boiling-point (q.v.) is the temperature at which vapor is freely given off—i.e., at which the tension of a vapor of a substance is equal to the atmospheric pressure. Dalton gave an empirical law, which is at all approximate only for temperatures near the boiling-point: 'The tension of a vapor of a substance rises in *geometric*, as the temperature rises in *arithmetical*, progression.' It is sufficient here to notice, that the tension increases very rapidly with the temperature. Some curious consequences result from this. Thus, water boils at 212° F., under a pressure of 30 inches, or at that temperature the tension of its vapor is *one* atmosphere. At 162° F., or 50° below its boiling-point, its vapor has a tension of 10 inches of mercury, and it will, therefore, boil, if placed in the receiver of an air-pump, as soon as two-thirds of the air have been extracted.

If a little water be boiled in an open flask till the steam has displaced a great part of the contained air, and the flask be then tightly corked, the water will gradually cool. If the flask be now dipped in *cold* water, boiling recommences, the cold water having condensed some of the vapor, and so diminished the pressure on the contained liquid. Dip the flask in *hot* water, and the boiling ceases. These appearances may be obtained several times in succession.

A fluid cannot be heated above its boiling-point, at the ordinary pressure of the atmosphere; but if it be heated in a closed vessel, the tension of the vapor produced is to be taken in addition to the former pressure, and the boiling-point rises with it. Thus, when the pressure is equivalent to 2 atmospheres, the boiling-point of water is raised 40° F. At such temperatures, its solvent powers are greatly increased. Many minerals found in fine crystals are supposed to have been deposited from water which had dissolved them in large quantities, under the combined influences of pressure and temperature. Papin's Digester (q.v.) depends upon this principle.

The amount of E. from a fluid depends on many circumstances. As, except in the case of actual boiling, it takes place only at the surface, the amount of surface exposed is an important consideration where rapid and copious E. is required, as in steam-boilers, salt-pans, etc. When, on the contrary, it is desirable to prevent E. as much as possible, a layer of oil, preventing direct contact with the air, is of great use. The rate of E. depends also on the pressure, and varies, according to Daniell, nearly inversely as

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the latter. His experiments, which appear trustworthy, were made in an exhausted receiver, and the vapor was removed as it was formed.

In the conversion of a fluid into vapor, a quantity of heat disappears; i.e., is required to produce and maintain the gaseous state. Thus, the temperature of steam at 30 inches is the same (to the thermometer) as that of the boiling water from which it comes off; but the heat necessary to convert a pound of water at 212° into steam at 212° , would raise nearly 1,000 pounds of water from 60° to 61° . See HEAT. When, therefore, a fluid evaporates, the vapor carries off heat from the fluid, and thus E. produces cold—a fact of daily observation. Porous earthenware jars are used to cool water in summer in this climate; and in India, ice is procured by exposing water in shallow pans, laid on straw, to the combined effects of evaporation and radiation at night.

On the same principle depends Sir John Leslie's method of freezing water. The water is placed in a flat porous dish, over a large surface of strong sulphuric acid, and the whole covered with the receiver of an air-pump. When a good vacuum has been produced, there is a rapid E., and the acid eagerly absorbing the vapor as it is formed, the process goes on without further working of the pump, till the residual water has become a solid cake of ice. A most extraordinary example of this production of cold is afforded by the freezing of water on a white-hot plate—by no means a difficult experiment. A platinum capsule is heated nearly to whiteness by a lamp placed underneath; a little water, mixed with sulphurous acid, which is an extremely volatile liquid (indeed it is gaseous at ordinary temperatures and pressures), is poured upon the plate. The acid instantly evaporates, and the cold produced freezes the water, which can be dropped from the hot plate on the hand as a lump of ice.

Another remarkable instance occurs in the formation of solid carbonic acid. The liquid acid is forced by the pressure of its own vapor in a fine stream into the air from a nozzle in the strong iron vessel in which it is contained. It evaporates so rapidly in air that a portion of the stream is frozen, and the delicate snowlike mass can be collected by proper apparatus.

In meteorology, E. is recognized as one of the most effective of all the gigantic processes that are continually going on around us. Watery vapor is continually rising invisible in the air; meeting with a colder stratum of the atmosphere, or the cold ridge of a mountain, it becomes condensed into mists or clouds; the fine particles of these unite into larger groups, and fall as rain, hail, or snow—to be again evaporated by heat from the moist ground, or from rivers, lakes, and seas. Even when otherwise invisible, its presence may be detected by its deposition as dew (q.v.), and, according to Clausius, in the blue of the sky, and the gorgeous tints of sunrise and sunset. There is little doubt of its being also intimately connected with the scintillation of the fixed stars: see SCINTILLATION. Atmospheric electri-

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city is largely due to E. directly as well as indirectly, on account of the amounts of vapor contained in different currents of air. It is matter of everyday observation how much the drying of the ground, or E. generally, is promoted by a brisk wind. This finds its explanation in the constant removal of the vapor as it is formed, the diffusion of the vapor taking place into comparatively dry air instead of the moist atmosphere into which it would take place in a calm. See RAIN: ATMOSPHERIC ELECTRICITY.

In agriculture, E. is the principal agency in the removal of an excess of water from land not naturally or artificially drained. In retentive soils, and those resting on impervious subsoil, the quantity to be thus removed is often very great, especially in the spring when the ground is soaked with melted snow and frequent rains, and in summer after heavy showers. The E. of this water proceeds slowly, and causes a loss to the soil of an immense amount of solar heat. This makes the ground cold and greatly hinders the farmer by delaying planting, retarding the growth of crops, and favoring early frosts in autumn. E. takes place much more rapidly from soils covered with plants than from those destitute of vegetation, and is increased by a rising and diminished by a falling temperature. In certain soils E. proves detrimental to plants by forming an almost impervious crust upon the surface, while in others it hardens the land to such a degree as to injure crops and prove a serious obstacle to cultivation. The remedy for the evils resulting from excessive E. of water from the soil lies in a thorough system of drainage. See DRAINAGE. (For evaporation or desiccation of fruits, see FRUIT).

EVARTS, *èv'arts*, JEREMIAH: 1781, Feb. 3—1831, May 10; b. Sunderland, Vt.: religious editor and promoter of Christian missions. He graduated at Yale 1802, taught school, studied law, was admitted to the bar 1806, and practiced in New Haven four years. He then became editor of the *Panoplist*, a religious (Cong). periodical of Boston, treas. of the A. B. C. F. M. 1812, editor of the *Missionary Herald*, which succeeded the *Panoplist* 1820, and sec. of the A. B. C. F. M. 1821, retaining the latter office till death. Among his publications were numerous essays in defense of the rights of the Indians. He was father of William Maxwell Evarts.

EVARTS, WILLIAM MAXWELL, LL.D: lawyer and statesman: b. Boston, 1818, Feb. 6; son of Jeremiah E. He took a preparatory course at the Boston Latin School, graduated at Yale 1837, studied law at the Harvard Law School and with Daniel Lord in New York, was admitted to the bar 1841, and rapidly attained distinction. In 1849, Apr. he was appointed deputy U. S. dist. attor. for the New York city district, and held the office four years. He acted as dist.attor. during the illness of the incumbent 1851, and successfully conducted the prosecution of the persons engaged in the Cuban filibustering scheme known as the 'Cleopatra expedition,' Apr., and the same year made an argument in favor of the constitutionality of the Metropolitan Police

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Act. In 1853 he resumed private practice, and as counsel for the state of N. Y. gained wide reputation by his conduct of the celebrated Lemmon slave case before the supreme court and the court of appeals. He became a republican soon after the organization of that party; was a candidate with Horace Greeley before the republican caucus for U. S. senator, when Ira Harris was chosen 1861; was leading counsel employed by Pres. Johnson when impeached by the house of representatives 1868, Apr.—May; was attor. gen. of the United States under Pres. Johnson 1868, July—1869, Mar. 4; and was appointed by Pres. Grant counsel of the United States before the tribunal of arbitration at Geneva to settle the 'Alabama' claims 1872. To his clear and unanswerable presentation of the disputed claims of American citizens was due, in great measure, the decision in favor of the United States. In 1875 he was senior counsel of Henry Ward Beecher in the suit brought against him by Theodore Tilton in Brooklyn; 1877, the republican advocate before the electoral commission; 1877—81 sec. of state of the United States; 1881 United States delegate to the international monetary conference in Paris; and 1885, Jan. 21. was elected U. S. senator from N. Y. for the term ending 1891, Mar. 3. He is conceded to be one of the most eloquent advocates in the United States, has been engaged in some of the most celebrated trials of his day, and for many years has been employed in cases in which large corporations were parties or interested. He is widely known also as a public orator, and has delivered memorable addresses in eulogy of Chief-Justice S. P. Chase at Dartmouth College 1873, June 25; on the 100th anniversary of American independence at Philadelphia 1876, July 4; at the unveiling of the statues of William H. Seward and Daniel Webster in New York; and at the dedication of the Bartholdi Statue of Liberty, 1886, Oct. 28. He received the degree LL.D. from Union College 1857, Yale Univ. 1865, and Harvard Univ. 1870.

EVASION, n. *ě-vā'zhŭn* [F. *évasion*—from L. *evasiōnem*—from L. *evāsūs*, gone out or forth—from *e*, out of; *vāsus*, gone or entered (see **EVADÉ**)]: the act of avoiding or eluding—applied particularly to speech; a shift; a subterfuge. **EVA'SIVE**, a. *-siv*, using artifice to escape or avoid; shuffling. **EVA'SIVELY**, ad. *-lī*. **EVA'SIVENESS**, n. *-nēs*, the state or quality of being evasive.—**SYN.** of 'evasion': prevarication; equivocation; shuffling; eluding.

EVE, n. *ěv* [Heb. *chavah*, Eve, literally meaning life]: wife of Adam, the first man; the mother of all living: see **ADAM AND EVE**.

EVE, n. *ěv*, or **EVEN**, n. *ě'vn* [contr. for **EVENING**, which see: AS. *æfen*; Icel. *aptan*; Ger. *abend*]: the close of the day; the night before a holy-day, as Christmas *eve*; time immediately preceding any important event.

EVECTICS, n. *ě-věk'tīks*: in *old med.*, that branch of medical science which treats of the method of acquiring a good habit of body.

EVECTION, n. *ě-věk'shŭn* [L. *evectiōnem*, a carrying

EVELYN—EVENING PRIMROSE.

out]: in *astron.*, an inequality of the moon's motion in its orbit, resulting from the combined effect of the irregularity of the motion of the perigee, and alternate increase and decrease of the eccentricity of the moon's orbit: see LUNAR THEORY.

EVELYN, *ěv'é-lĭn*, JOHN: 1620, Oct. 31—1706, Feb. 27; b. Wotton, seat of the Evelyn family, in Surrey. He was educated at the free school of Lewes, and at Balliol College, Oxford. In 1640, he entered the Middle Temple, and in the following year, prompted by the ominous appearance of public affairs, and after having witnessed the trial of Strafford, he set out for the continent, returning, however, in the autumn. In 1642, upon offering his services to Charles I., he was accepted as a volunteer in Prince Rupert's troop, but 1643 he again went to the continent, where he mainly lived for eight years. After 1652 he settled in England, where he lived studiously and in private till the Restoration, after which he was much employed by the government. On the organization of the Royal Soc., he became one of the first members, and was an industrious contributor to its Transactions. He succeeded 1699 to the family estate at Wotton, and there, after a long studious, and highly useful life, he died.

His principal works are—*Sculptura, or the History and Art of Chalcography and Engraving on Copper*, 1662; *Silva, or a Discourse of Forest Trees, etc.*, 1664; and his *Memoirs* (published 1818), to which E. owes celebrity. They are in the form of a diary, and continued during a period of about 70 years—and these the most dramatic in the recent history of England. They are of inestimable value.

EVEMERUS, or EUHEMERUS: see EUHEMERISM.

EVEN, a. *ěvn* [Ger. *eben*; Dut. *even*; Icel. *jafn*, equal, plain: L. *æquus*, even]: having a flat or smooth surface; level; not rough; equal; calm; not easily disturbed; balanced or settled; not odd, as a number: AD. or CONJ. in like manner or degree; precisely the same; at the very time; so much as; denoting an increase, addition, or slight exaggeration; denoting emphasis, as, 'I, even I': V. to level; to lay smooth; to place in an equal state. EVENING, imp. *ěvn-ing*. EVENED, pp. *ěv'nd*. EVENLY, ad. *ěvn-lĭ*. E'VENNESS, n. state of being level or smooth. EVEN-HANDED, impartial; just. EVEN-KEEL, said of a ship having the same draught of water fore and aft.

EVEN, n. *ěvn*: for EVENING, which see. EVEN-SONG [AS. *æfen-sang*, vespers (see EVE)]: vespers; in the *Book of Common Prayer*, evening service as distinguished from 'Matins' or morning service—referring to the time when intoning the service was nearly universal. EVEN-TIDE [AS. *tīd*, time, season]: the evening.

EVENING, n. *ěvn-ing* [Dut. *avend*; Ger. *abend*, the sinking of the day: Swiss, *aben*, to fall off—from Ger. *ab*, off, away]: the close or last part of the day; the beginning of the night or darkness; the decline or latter part of life: ADJ. relating to or at the close of the day.

E'VENING PRIMROSE: see CENOTHE'RA.

EVENING SCHOOLS.

EVENING SCHOOLS: helps toward popular education. They either take the form of lectures or lessons, carrying further the education received at school, or they aim to supplement defective early training, or, it may be, to give the simplest rudiments of elementary instruction to adults under the disadvantage of being pupils for the first time in their lives. The former are found chiefly in connection with mechanics' institutes, now very numerous in Great Britain, and extending in the cities and large towns of the United States—a most important educational agency; or with existing day schools, and congregational organizations; while the latter more frequently fall under the head of parochial missionary work, or are connected with factories. These latter constitute the class of evening schools which now engage most interest in England and which present the greatest difficulties in working.

The total number of E. S. of this humbler class (under govt. inspection) in England and Wales in 1881, was about 1,561; of these, 875 were conducted by the National Soc or the Church of England, 33 by the Wesleyans, 277 und . nominal, 63 Rom. Cath., and 313 by School-board. The total numbers of scholars in attendance was 52,530, o. whom 42,638 were male. In Scotland, *primary* E. S. are not so usual as in England, education being more generally diffused. The first E. S. proper, in Britain, for boys and girls who had to work all day for a livelihood, was founded in Bristol, Eng., 1806. Her majesty's inspectors, the Royal Commissioners (1861), and the clergy of all denominations, strongly recommend the extension of this agency. 'If the education of the country were in a good state,' say the commissioners, 'evening schools would be nearly universal, and would serve to compensate the scantiness of the instruction given in day schools, by giving more advanced instruction to an older class of scholars.'

State Aid, and Voluntary and Paid Teachers.—Many educationists have come to the conclusion, that the hope of retaining children in school until they have obtained as much instruction as is requisite for their guidance in life, is vain, and consequently look to E. S. as an indispensable part of a national system of education, and consider them entitled to look to the state for encouragement and support to an equal extent with day schools. Bp. Hinds was the first *publicly* to suggest (1839) that evening schools fairly come within the sphere of state action in Great Britain. The recent inquiries have brought out that the majority of those who frequent existing evening schools have never received any elementary instruction, or have forgotten what they once knew, and that a large proportion are either adults or adolescent young men and women. They attend for the purpose of learning to read, write, and cipher. Though in many instances, especially where no fee is charged, the irregularity and unpunctuality of the attendance are great, yet in the majority of cases there is an earnest desire on the part of the pupils to benefit by the instruction. It is a question of some national importance how far schools of this supplementary class should be left to pri-

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Schools for those who wish to learn reading and writing for the first time seem scarcely to exist, probably because not needed. The schools which do exist have an affinity to mechanics' institutes. The instruction is given on Sundays and holidays, and in many places also on one or two evenings in the week. But Sunday instruction alone seems to have been originally contemplated. See SUNDAY SCHOOLS. The subjects taught are the ordinary branches, with geography, free-hand and geometrical drawing, geometry, and in some cases the elements of natural science and the laws of health. These institutions are supported by the funds of the commune or district; in some cases supplemented by the state.

In the United States, with few exceptions, the establishment and maintenance of E. S. are directed by the public school officers of the co., city, town, or village. The state school laws of Mass. provide that towns having free public schools may keep them open day or evening, and that every town and city having 10,000 or more inhabitants must maintain E. S. in addition to their regular day-schools. It is provided in O. that in any district composed in whole or in part of a city or village the board of education or school trustees may establish a suitable number of E. S. Elsewhere, and particularly in large or distinctly manufacturing cities and towns, local educational authorities establish E. S. during the winter months, in which either a general or a technical curriculum is followed, for the benefit of persons, old or young, who cannot avail themselves of the regular facilities during the hours of labor. The first E. S. were established by private benevolence, and many noted ones are still so sustained. The Cooper Union (q.v.) for the Advancement of Science and Art in New York, with its free night schools of phonography, typewriting, and telegraphy; its school of science with 14 classes in technical branches; and its school of art with 9 classes, is of this character. E. S. in general are in the immediate charge of as many principals of the day schools as are required, and while some ambitious day-school teachers also take E. S. classes, it is far more common to select subordinate teachers for E. S. from the list of approved candidates for classes in the day schools and the pupils of the co. or city normal schools. The popularity of E. S. is increasing rapidly in the thickly settled portions of the country, and their statistics must soon form an interesting feature of public educational reports.

- **EVENT**, n. *ě-vent'* [L. *eventus*, come to pass, happened —from *e*, out of; *venĩō*, I come]: that which happens or comes to pass; any incident, good or bad; the conclusion; the result. **EVENT'FUL**, a. *-fŭl*, producing great changes; full of events. **EVENT'UAL**, a. *-ŭ-àl* [F. *éventuel*]: happening as a consequence; coming as a result; final; contingent. **EVENT'UAL'ITY**, n. *-àl'ĩ-tĩ*, the coming or happening as a consequence; contingency; dependence upon an uncertain event; an organ in phrenology, said to enable one to note and compare all the active occurrences of life. **EVENT'UALLY**, ad. *-ĩ*. **EVENTUATE**, v. *ě-vent'ŭ-āt*, to come out as

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a result; to come to an end. **EVENT'ING**, imp. **EVENT'UATED**, pp.—**SYN.** of 'event': circumstance; incident; adventure; issue; occurrence; termination; consequence; end.

EVENTRATION, n. *ē-vĕn-trā'shŭn* [F. *eventrer*—from L. *e*, out; *venter*, the belly]: in *surg.*, a tumor produced by the relaxation of the abdominal wall and ultimately affecting a great part of the abdominal viscera: also a large wound in the abdomen through which the intestines protrude.

EVER, ad. *ĕv'ēr* [AS. *æfre*, ever; Goth. *aivs*, long time; Dut. *eeuw*; L. *ævum*; Gr. *aiōn*, an age]: at any time; always; in any degree; contr. into **E'ER**, *ār*. **EVER AND ANON**, frequently repeated. **EVER SO LONG**, a very great time. **FOR EVER**, unendingly. **FOR EVER AND EVER**, duration without end. **EVERLAST'ING**, a. *-lāst'ing*, lasting for ever; perpetual: N. never-ending duration; the Deity without beginning or end. **EV'ERLAST'INGLY**, ad. *-lī*. **EVERLAST'INGNESS**, n. **EV'ERGREEN**, n. a plant or tree that retains its greenness throughout the year. **EV'ERMORE'**, ad. *-mōr'*, unendingly; always. **EVERLASTING FLOWERS**, flowers which when plucked and dried retain their color for a long time. **EVER A** or **E'ER A**, in *OE.*, any. *Note.*—**EVER**, as part of a word, denotes without intermission. **EVERLASTING**, that which has no end. **ETERNAL**, that which has neither end nor beginning.—**SYN.** of 'everlasting, a.': endless; interminable; unceasing; continual; uninterrupted; incessant; unintermitted; immortal; eternal; infinite; for ever.

EVEREST, *ĕv'ēr-ĕst*, **MOUNT**: highest known point on the earth: peak of the e. range of the Himalaya Mountains in n. Nepaul; n.e. of Khatmando, between the peaks of Dhawalaghiri and Kunchain-Junga; lat. 27° 9' 16" n., long. 85° 58' 8" e.; height above sea level as measured 1856 by Waugh, 29,002 feet.

EVERETT, *ĕv'ēr-ĕt*: town of Middlesex co., Mass., on the Eastern railroad, 3 m. n. of Boston, with which it is connected by a street railroad. It was a part of Malden till 1870, is lighted by gas, receives its supply of water from the Mystic waterworks of Boston; has 4 churches, a young ladies' institute and several public schools, and baby-carriage, chemical, phosphate, and rope factories. Pop. (1870) 2,220; (1880) 4,159; (1885) 5,375; (1890) 11,068.

EVERETT, *ĕv'ēr-ĕt*, **ALEXANDER HILL**: 1792, Mar. 19—1847, June 28; b. Boston: diplomatist and author. He entered Harvard College 1802, and graduated 1806, though the youngest of the *alumni*, with the highest honors. After practicing as a lawyer, he was appointed U. S. ambassador at the Hague 1818; and went in the same capacity to Spain 1825. Four years afterward, he returned to the United States, and became proprietor and editor of *The North American Review* (1830-35), and was in the legislature of Massachusetts. In the winter of 1840, he resided in Cuba, as a confidential agent of the United States govt. He sailed for China as minister-plenipotentiary 1845, and

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died at Canton. E. was a man of great versatility of talent and of extensive erudition. Politics and belles-lettres, political economy and poetry, statistics and æsthetics, alternately engaged his thoughts and pen. His writings are — *Europe, or a General Survey of the Political Situation of the Principal Powers*, etc. (London and Boston, 1822); *New Ideas on Population*, etc. (London and Boston, 1822); *America, or a General Survey of the Political Situation of the Several Powers of the Western Continent*, etc. (Phila. 1827), in which he labors to show that Russia and the United States must in the long-run share the continent between them; *Critical and Miscellaneous Essays* (two series, Boston 1845 and 47). These are on a vast variety of subjects, and are probably the most interesting productions of his pen. E. published a vol. of poems 1845.

EVERETT, EDWARD, LL.D., D.C.L.: 1794, Apr. 11—1865, Jan. 15; b. Boston: orator and statesman. He studied in the public schools, where he twice won the Franklin medal, and at Exeter Acad., graduated at Harvard Univ. with high honors when a little more than 17 years old (1811), was appointed tutor of Latin at Harvard, studied theology, and was ordained pastor of the Brattle Street (Unit.) Church, Boston, 1814, Feb. 9. In 1815, Mar., he was chosen Eliot prof. of Greek literature at Harvard Univ., and, resigning his pastorate, went to Europe, studied at the Univ. of Göttingen two years, and spent two years in travel and special study in Greece. Returning 1819, he entered upon his duties as prof., and held the chair till 1825. He delivered a sermon in the hall of the house of representatives, Washington, 1820, which was pronounced a masterpiece of pulpit eloquence; an oration (Phi Beta Kappa) at Cambridge before a distinguished audience, that included Gen. Lafayette, 1824, Aug.; and one on Forefathers' Day at Plymouth in Dec. following. In 1824 he was elected member of congress from the Middlesex dist.; resigned his professorship the following year; served in congress by re-elections till 1835, when he was elected gov. of Mass.; was re-elected three times, and defeated the fourth year by one vote out of over 100,000. In 1840 he established himself in Florence, Italy, for the purpose of writing history, but within a few months was summoned to London to enter upon the duties of U. S. minister, to which he had been appointed through the influence of Daniel Webster and without his own knowledge. After four years of diplomatic service in England, he returned to the United States, again promising himself a period of leisure to undertake his projected historical work, and again meeting disappointment, as he was immediately elected to the vacant presidency of Harvard Univ., which office he held 1846-49. He then sought retirement in his own choice library in Boston, where he was undisturbed by calls to public duty till 1852, Nov., when upon the death of Daniel Webster, then U. S. sec. of state, he was appointed by Pres. Fillmore to the vacant office. He served to the close of that administration, was then elected U. S. senator by the Mass. legislature to succeed John Davis, resigning after one year because of ill health.

EVERGREENS

In 1860 he was a candidate for the vice-presidency of the United States on the ticket with John Bell, of Tenn., but failed of election. The latter years of his life were passed in lecturing and literary work, his last public utterance being an oration on *The Relief of Savannah*, in Faneuil Hall, Boston, six days before his death. He delivered his oration on the *Character of Washington* for the benefit of the Mount Vernon fund 122 times, and turned over \$60,000 as the net proceeds; an address on *Charitable Institutions and Charity* for the Boston Provident Assoc. 15 times, netting \$13,500; and one on the *Early Days of Franklin* for several institutions 5 times, netting \$4,000. He published four vols. of *Orations and Addresses* (1836, 50, 59), beside numerous special works. While U. S. minister to England, he received the degree D.C.L., from Oxford, and LL.D., from Cambridge and Dublin Universities, and was elected a member of the French Institute. As an orator he was elaborately finished and elegant in composition and delivery.

EVERGREENS: trees and shrubs which retain their foliage and remain fresh and green through the winter. The leaves are usually thicker and firmer than those of deciduous trees, while the breathing-pores, or *Stomata* (q.v.), are less in number and appear only on the under surface. In some species, as the fir, the leaves are small and narrow; in others, as the rhododendron, they are large and broad. In most species of E. the leaves fall in the spring when new ones are formed, but the change is effected so gradually that the branches are never bare. Nearly all the *Coniferae* are E. Though growing readily in widely differing climates they largely prevail in northern latitudes, where dense forests of pines, firs, and kindred species are common. They are extremely hardy, and resist the destructive action of frost better than the deciduous trees of cold climates. Certain species, as the pine, thrive best on dry ground, and it is claimed by some that they strongly tend to desiccate the soil. It is not probable that this is the case, though there is no doubt that in winter they exhale moisture in somewhat greater degree than deciduous trees.

Some of the most magnificent E. in the world are in the w. part of the United States. The great California tree (*Sequoia gigantea*) reaches a diameter of 20 to 35 ft., and a height of nearly 300 ft. E. of moderate size are found in vast numbers in the wooded portions of the country, and some of the species, as the pine, spruce, and cedar, are among the finest timber trees. E. are also planted largely for ornamental purposes. Among the best varieties are the Norway Spruce, Scotch Pine, Austrian Black Pine, White Pine, Hemlock, Red Cedar, and Arbor Vitæ. E. should be planted when the first bright new leaves appear (in the Northern States in May or June), because then the sap is thin and less likely to thicken fatally into gum in the process of transplanting. Care is needed to keep the roots from drying in that process, which must be followed by mulching. Sometimes, but rarely, E. succeed on prairies as screens for

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orchards. For this purpose the Norway Spruce, Hemlock, and Fir have proved of great value. If only a single row of trees is put out, they should be planted not more than eight ft apart. A double row, with the trees 16 ft. apart, though requiring more land, will be much more efficient. E. are used to quite an extent also for fencing purposes, but are gradually losing popularity for this use. The Arbor Vitæ is quite hardy, thrives in a great variety of soils and climates, and forms a beautiful and useful hedge. At the holiday season small E. are in great demand for Christmas trees, and branches are freely used in the interior decoration of public and private buildings.

EVERICULUM, n. *ē-ver-rīk'ū-lūm* [L. a drag-net; *everro*, I sweep out]: in *surg.*, an instrument somewhat resembling a spoon, designed to clear the bladder from fragments of calculi, after the operation of lithotomy.

EVERLASTING FLOWER: popular name of certain plants, the flowers of which suffer little change of appearance in drying, and may be kept for years without much diminution of beauty. They are of the order *Composite*, having their flowers (heads of flowers) surrounded with an involucre; the scales of which resemble the petals of a corolla, but are rigid, membranous, and contain little moisture. Some species of cudweed (q.v.) (*Gnaphalium*) are often called E. F., and the other plants which bear the name belong to nearly allied genera, but particularly to the genus *Helichrysum*, which contains a great number of species, natives mostly of Africa. *H. arenarium* is frequent on dry sandy soils in many parts of Europe and central latitudes of Asia. It is covered with a gray felted down, and has yellow flowers, which, when rubbed, emit a faint aromatic odor. *H. angustifolium* and *H. Stæchas*—shrubby species, natives of the s. of Europe—have larger yellow flowers. Some species have a powerful and pleasant aromatic odor. In France these flowers are called *Immortelles*, and often woven into circular wreaths, and placed beside recent graves, as emblems of immortality.

EVERNIA, n. *ē-ver'nī-a* [Gr. *euernēs*, sprouting, flourishing; *eu*, well; *ernos*, a young sprout, shoot, or scion]; in *bot.*, a genus of lichens, order *Parmeliaceæ*. *Evernia prunastri* is common on trees, but does not often produce fruit. It is said to be an astringent and a febrifuge. It can also be used for dyeing. Formerly it was ground down with starch to make hair-powder, and it has been used as a substitute for gum in calico printing. EVERNIC, a. *ē-ver'nīk*, belonging to or in any way connected with the genus *Evernia*.

EVERSION, n. *ē-ver'shūn* [F. *éversion*—from L. *eversio-nem*, a turning out or expulsion—from *e*, out; *versus*, turned]: the protrusion of organs from a cavity; the state of being turned back or outward.

EVERSLEY, *ēv'ērz-lē*, VISCOUNT (CHARLES SHAW LEFEVRE): 1794, Feb. 27—1888, Dec. 28: parliamentarian, descended maternally from the Lefevres, who came to England from Rouen on the revocation of the Edict of

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Nantes. He was educated at Winchester and Trinity College, Cambridge, called to the bar at Lincoln's Inn 1819, entered parliament 1830 as member for Downton, and represented Hants 1831-57. In 1839 he was chosen speaker of the house of commons; and re-elected in the parliaments of 1841, 47, and 52. He retired from the office 1857, with a peerage and a pension of £4,000 a year. During the 18 years of his speakership, he suggested and carried out many improvements in the forms and procedure of the lower house, tending to the dispatch of business. He was dignified in person, affable and accessible to the younger members, and profoundly versed in the laws of debate and parliamentary practice.

EVERT, *v.* *ě-vért'* [*L. e; verito*, I turn]: to destroy; to overthrow; in *med.* and *bot.*, to turn outward.

EVERY, *a.* *ěv'ér-ĭ* [*AS. æfre*, ever; *ælc*, each: *OE. ever-ælc*, every]: the whole, taken one at a time; each one of a whole. **EVERYDAY**, *a.* common; usual. **EVERYTHING**, *n.* all without exception. **EVERYWHERE**, *ad.* *-hwēr* [*ever*, and *AS. gehwær*, on every side]: in all places. **EVERY NOW AND THEN**, at short intervals; frequently.

EVEDROPPER, *n.* *ěvz'drōp'pēr* [*AS. efese*]: see **EAVESDROPPER**.

EVESHAM, *ěvz'am* or *ěvz'ham*, originally **EOVESHAM**: municipal borough in the s.e. of Worcestershire, England, on the right bank of the navigable Avon, 15 m. s.e. of Worcester. It has a fine modern bridge, and a belfry which dates from 1533. Public gardens and water-works have recently been added. *E.* lies in a beautiful and fertile vale, and market-gardening is the chief industry. It has some manufactures of agricultural implements. Simon de Montfort was defeated at *E.* 1265.—*Pop.* (1881) 5,112.

EVICT, *v.* *ě-vikt'* [*L. evictus*, conquered completely—from *e*, out of; *vinco*, I conquer]: to dispossess of lands or tenements by legal proceedings, as a tenant by a landlord; to recover land, etc., by legal process. **EVIC'TING**, *imp.* **EVIC'TED**, *pp.* **EVIC'TION**, *n.* *-vĭk'shŭn* [*F.—L.*]: the recovery of lands or tenements from another's possession by legal proceedings, in virtue of a preferable title. Eviction from land alone is sometimes called Ouster. See **BALFOUR**, **ARTHUR JAMES**; **DAVITT**, **MICHAEL**; **GLADSTONE**, **WILLIAM EWART**; **HOME RULE**, in Ireland; **LAND LEAGUE**, **IRISH**; **PARNELL**, **CHARLES STEWART**.

EVIDENCE, *n.* *ěv'ĭ-děns* [*F. évidence*—from *L. evidētem*, plain, distinct—from *e*, out of; *vidēō*, I see—*lit.*, state of being plain and distinct]: a witness; that which enables the mind to see truth; proof; testimony; certainty: *V.* to prove; to show; to make clear to the mind. **EVIDENCER**, *-sēr*, witness, one who gives evidence. **EV'IDENCING**, *imp.* **EV'IDENCED**, *pp.* *-děnst.* **EV'IDENT**, *a.* *-děnt* [*F.—L.*]: plain; clear; obvious; open to be seen. **EV'IDENTLY**, *ad.* *-lĭ*, plainly; notoriously. **EV'IDENT'IAL**, *a.* *-děn'shāl*, clearly proving. **EVIDIBLE**, *a.* *ěv'ĭ-dĭ-bl*, capable of bearing evidence.—**SYN.** of 'evident': manifest; apparent; notorious; visible; conspicuous.

EVIDENCE.

EVIDENCE, in Law: the means by which matters of fact may be proved or disproved. E. may be either oral, i.e., consist of the statements of witnesses given in court, or documentary, i.e., made up of writings of various kinds. The weight to be attached to any particular E. is a question entirely within the province of the jury; but whether such E. is competent or admissible to prove or disprove the issue under consideration, is for the judge to determine.

Since proof amounting to the certainty of demonstration is available only in abstract science, and does not exist in the common relations of mankind, a standard short of demonstration, yet sufficient to convince the mind, must be applied to the settlement of disputes in courts of law. The burden of proving a fact is always upon the party asserting or seeking to maintain the affirmative. Such a fact is sufficiently proved, in a civil case, by a preponderance of E., but in a criminal trial, in order to convict, the jury must be satisfied beyond a reasonable doubt, that the prisoner committed the offense with which he stands charged. Certain things are said to be 'judicially taken notice of' in courts of law, which simply means that their existence is assumed without any proof in the particular case. Instances are—the public acts of sovereign states, the meaning of ordinary words and abbreviations, the well known and commonly observed phenomena of nature, the divisions of time universally recognized, and the like. E. is spoken of as *direct* or as *circumstantial*. Direct E. is that of witnesses deposing of their own personal knowledge to facts, while circumstantial E. is the inference drawn from facts proved. Attempts have been made to throw discredit upon circumstantial E., but properly regulated by the abundant tests and safeguards which the law places around this method of proof, it becomes as effective as direct E. for the discovery of truth. Sometimes it is even more convincing.

Presumptive E., or E. assumed by the court to exist on a given state of facts being proved, is founded upon presumptions of law and presumptions of fact. Presumptions of law are again divisible into conclusive and disputable presumptions. In conclusive presumptions, no E. is permitted to be received to rebut the inference, which the law, for reasons of expediency, says shall be drawn in such cases. In disputable presumptions, however, E. may be received to rebut the influence, which otherwise would be drawn. E., to be legally receivable in a court of justice, must be relevant; that is to say, it must be so connected with the issue in dispute as directly to prove, or have a tendency to prove, that particular issue, and it must be the best E. which can, under the circumstances be procured. Witnesses are permitted to testify only as to such facts as are within their own knowledge. Statements communicated to a witness by a third party, whether spoken or written, are called 'hearsay,' and unless under the circumstances such statements can be shown to be original E., they cannot be received. To this rule, however, there are exceptions, founded upon the difficulty or impossibility of procuring better E. in the excepted cases. The testimony of *inter-*

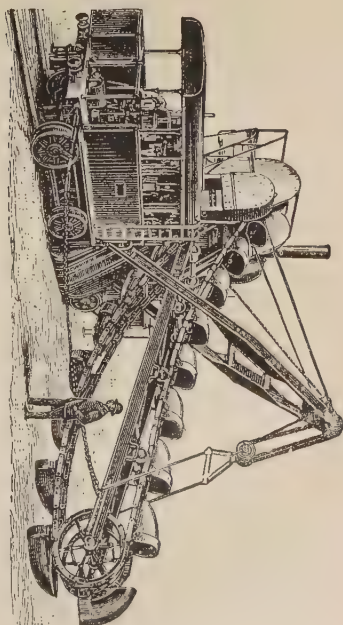


Evergreens.—A, Ardisia; B, Holly (*Ilex*); C, Skimmia.



Everlasting Flower (*Helichrysum bracteatum*).

Steam Excavator.



EVIDENCES OF CHRISTIANITY.

ested witnesses, formerly not admissible, is now received and estimated at its value in view of their interest in the case. Charles J. McCurdy of Conn. secured this change in that state abt. 1848; N. Y. followed; then the other states. In 1851, Mr. McCurdy visited England, and his presentation of the question wrought a change in the law there, also, which has often been incorrectly attributed to Lord Denman. Certain kinds of E. are not received in courts on the ground that the interests of society require them to be excluded. Such are the testimony of husband and wife in certain cases, and professional communications made to a lawyer. Although not so at common law, by statute in many of the American states, confessions to a minister of religion, and information imparted to a physician in the course of professional treatment, cannot be revealed upon the witness stand. This restraint of secrecy is placed also upon the doings of grand jurors, judges, and state officials. The method of procuring the attendance of witnesses, if within the jurisdiction of the court, is by *sub. pena*. If beyond the jurisdiction of the court, or within its jurisdiction, but unable to attend personally, the method of procuring the witness' testimony is by commission or deposition respectively. As a rule, a witness in a civil case is entitled to a fee for attending and for his travelling expenses, varying in the different states. In criminal cases, a witness is usually required to attend without fee. The practice in swearing witnesses is to have the witness lay his hand upon and kiss the volume containing the gospels, but a witness may be sworn in any manner obligatory upon his conscience. In some of the American states, a simple affirmation on the part of the witness is deemed sufficient. A witness is not bound to answer where such answer will expose him to a forfeiture of his property, or to a criminal penalty, nor is any inference permitted to be drawn prejudicial to the witness from such refusal to answer. But if the answer merely exposes the witness to a civil action, or pecuniary loss, or has a tendency to degrade his character, he is not excused from answering. The principles applicable to the admissibility and competency of E. are usually the same in civil as in criminal trials. But in criminal trials two very important facts must be proved. These are the *corpus delicti*, and the identity of the prisoner. By the *corpus delicti* is meant the body of the offense. Thus, if a murder or robbery is charged, a murder or robbery must first be proved. A neglect to insist upon a strict adherence to this rule might result in a conviction of a person of murder, while the person supposed to be murdered might still be living. The proof of the identity of the prisoner also is fundamental.—See OATH: JURY: WITNESS: DEED: TESTING: ETC. See also works on E. (American), Greenleaf; (English) Taylor; (Scotch) Dickson.

EVIDENCES OF CHRISTIANITY: see CHRISTIANITY.

EVIL.

EVIL, a. *ē'vl* [Ger. *übel*; Goth. *ubils*; Dut. *evel* and *euvel*: comp. Gael. *aimh* = *av*, a prefix denoting negation or deprivation]: ill; wicked; vicious; having bad qualities of any kind; injurious; unfortunate; unkind. N. wickedness; misfortune; calamity; the reverse of good; suffering; that which produces pain; any transgression of the moral law; sin. **EVILNESS**, n. badness of whatever kind. **EVIL-MINDED**, possessed of bad dispositions. **EVIL-DOER**, a wicked person. **EVIL-EYE**, influence for injury, supposed to be possessed by certain persons who cast an envious or hostile look on any other person or object. **EVIL-EYED**, *-īd*, having an evil-eye with the power of fascination. **EVIL-SPEAKING**, slander; calumny. **EVIL ONE**, Satan. **EVILLY**, ad. *ē'vl-ī*, in an evil manner. **EVIL-WORKER**, one living in habitual wickedness. **KING'S EVIL**, scrofula—so named from the former popular belief that it was curable by the touch of royalty (see **SCROFULA**).—**SYN.** of 'evil, a.': bad; perverse; wrong; calamitous; mischievous; pernicious; hurtful; destructive; corrupt.

EVIL: the opposite or negation of good; popularly, either wickedness or calamity; essentially and morally, that which is opposed to the divine order of the universe. A superficial observation shows many apparent exceptions to the pervading harmony and happiness of creation: there are convulsions in the physical world; there are suffering, decay, and death throughout the whole range of organic existence; and the appellation of evil is commonly applied to such phenomena. In the face of the human consciousness, such phenomena appear to be infractions of the general order and good, and it pronounces them *evil*. How far the internal feeling of wrong has been quickened and educated by such outward facts, it is difficult to say, but, beyond doubt, they have exercised upon it a powerful influence. Every form of religion testifies to the recognition of evil in the external world, and superstition in all its shapes rests mainly upon it.

But it is in the sphere of moral life alone that the conception of evil can be said to hold good. After the light of science has explored the secrets of nature, and shown how its apparent anomalies are merely manifestations of a comprehensive harmony, the idea of evil is dispelled from the merely material creation. 'Whatever is, is best,' is seen to be everywhere the law of this creation. There remains, however, the ineradicable feeling of evil in human life and manners and history. There is in the moral consciousness of man a sense of violated order, of transgression of divine law, or what is called *sin*, which is *evil* in its essential form. This fact of evil is everywhere appealed to by the Christian religion; it is the aim of this religion to deliver men from its power and misery. Every ethical and judicial code is based upon its recognition, and is designed to protect human society from its injurious consequences. It cannot be better or more clearly defined than as a lack of conformity to, or as a transgression of the divine law.

The question of the *origin of evil* has been greatly discussed, and received various answers. The simplest and

EVIL.

most direct of these answers is that which maintains a double origin of things, or a system of *dualism*. This conception lies at the bases of many forms of religion; it may be said to be the fundamental conception of all mere nature-religions. Interpreting the obvious appearances of nature, they embody in divine personalities its contending manifestations of light and darkness, benignity and terror. The opposition of Ormuzd and Ahriman in the old Zoroastrian faith is one of the most conspicuous examples of this religious dualism. Manicheism, which spread so widely in the 4th and 5th c., and the Syrian gnosticism from which it sprang, also are historical illustrations of the same principle.

The dualistic theory of the origin of evil, however, could not obviously maintain itself with the advance of speculation and the spread of Christian truth. It was no less clearly a postulate of the cultivated reason than a dictate of divine revelation, that the world proceeded from and is upheld by One absolutely Divine Creator, holy and good, of whom, and through whom, and to whom are all things. It was necessary, therefore to reconcile the appearance of evil with this fundamental admission.

The doctrine of the Fall, especially in the later development which connects it with the existence of a devil or evil spirit, tempting man in the shape of the serpent, was supposed to explain the appearance of evil in human history. Being tempted of the devil, man sinned, and so fell from his obedience to the divine law. This has been known as the orthodox Christian answer to the inquiry, how sin came into the world? And many minds, seeking only the origin of sin in human history, carry the inquiry no further. It is clear, however, that this explanation of the historical origin of evil leaves the question of its ultimate and absolute origin unsettled. The devil being assumed as the cause of man's sin, the further question arises, whence the devil? Is he an absolute personality? in which case we are landed in the old theory of dualism; or is he, according to the traditional Christian conception, a fallen angel? in which case the former question returns, whence the spring of evil in him? There is no real explanation gained by this removal of the question; it is still the same difficulty—whence the origin of evil in the creation of an all-perfect being, almighty as well as all-wise and good?

Speculation may please itself with ingenious and sometimes instructive answers to this question, but in truth it admits of no satisfactory solution by man's present faculties and with his present knowledge. Some, for example, have argued that evil, like darkness or cold, is an indispensable element of alternation or contrast in human life. All individual reality is only the product of opposite forces working together. Character could arise only from the interaction of opposing ethical influences of good and evil. In nature, we have attraction and repulsion, rest and motion, positive and negative electricity; why should it be different in the sphere of morals? Here, too, there must be polarity. Good can exist only in contradistinction to evil; the one no

EVIL EYE.

less than the other is necessary to constitute the drama of human life and history. Others, again, have argued, that evil is the result of what is called metaphysical imperfection. God alone can be perfectly good. The creature, in its very nature, is limited, defective; and evil is nothing else than the evidence of this limitation in man. It is not something real or positive, but only a privation. It is in morals what cold and darkness are in physics, a pure negation. Thus have argued such profound thinkers as Augustine and Leibnitz. But it requires little penetration to see that such arguments, however ingenious, and so far well founded, do not meet the essential difficulty of the problem. If evil be, according to such views, a necessary element of human life, in the one case, in order to develop its activity, in the other case, as clinging to its creaturely limitations, then plainly it is not, as regards the whole scheme, *evil*, but is essentially so only in and as concerns the individual who develops it: it is not, and cannot be a contradiction of the true idea of human life, and at the same time a necessary element of it. Whatever necessarily belongs to life, must help its true development, and not injure and destroy it; must be *good*, in short, and not *evil*. Such theories, therefore, solve the problem only by eliminating the fact. The origin of evil must be deemed inscrutable, as being dependent on the free moral agency of personal beings. It is in its ultimate sense conceivable only as a possible quality of free moral action; and moral freedom in man or any created being is one of those ultimate facts which are a profound mystery. It is something which 'we apprehend, but which we can neither comprehend nor communicate.' Evil, in its essential (i.e., moral) sense can be overcome: *good* is more ancient and more strong.

EVIL EYE: supposed power of inflicting injury by a look. Both in ancient and modern times, the belief that some persons have the power of injuring others by looking upon them, has been widely diffused. The Greeks frequently speak of the *Ophthalmos Baskanos* (evil eye), which they conceived specially dangerous to children; and the Romans used the verb *fascinare* to express the same fact. Pliny speaks—not on his own authority, however—of 'those among the Triballians and Illyrians, who with their very eyesight can witch (*effascinent*), yea, and kill those whom they look wistly upon any long time;' and Plutarch states, on the authority of Philaretus, that 'the Thybiens who inhabited Pontus were deadly, not only to babes, but to men grown, and that whomsoever their eye, speech, or breath would reach, were sure to fall sick, and pine away.' Menalcas, in Virgil (*Ecl.* iii. 102), also complains that some evil eye has fascinated his young lambs—

Nescio quis teneros oculus mihi fascinat agnos.

The principal amulet used by the ancients was the *phallus* or *fascinum*, as the Romans called it, which was hung round the neck of children. Of course, this superstition, like all others, flourished in Europe during the middle ages. See Reginald Scot's *Discovery of Witchcraft*; the *Opusculum de*

Fascino of John Lazarus Gutierrez, a Spanish physician, published 1653; and the *Tractatus de Fascinatione* of John Christian Frommann, physician of Saxe Coburg, 1675. In the British Isles, also, the belief in the power of the evil eye is of old date, and is not dead, at least in Ireland and the Highlands of Scotland. In these countries (as elsewhere), it was once a very common superstition that cattle were subject to injury in this way. Witches had the power to a malignant degree; and various charms, such as twining mountain-ash among the hair of the cow's tail, were used to avert or destroy their noxious influence. In the East, the notion was and is prevalent. The Persians have various methods of discovering the special kind of fascination by which a person is afflicted; and Dallaway, in his *Account of Constantinople* (Lond. 1797), affirms that 'nothing can exceed the superstition of the Turks respecting the evil eye of an enemy or infidel. Passages from the Koran are painted on the outside of the houses, globes of glass are suspended from the ceiling, and a part of the superfluous caparison of their horses is designed to attract attention, and divert a sinister influence.' Hobhouse, in his *Travels*, bears equally conclusive testimony to the prevalence of this superstition in the Turkish empire, not among Mohammedans only, but among Christians also; while Lane, in his *Modern Egyptians* (1836), gives an account of the precautions taken by the Egyptians to avoid the influence of evil eye. The American Indians partake of the same belief; and it is not improbable that on profound investigation it would be found that every nation that exists or has existed, with anything like a developed system of superstition, believes or has believed in the reality of this fascination in some form or other.

The universality of this superstition goes far to prove that it has what may be called a *natural* origin; and, indeed, as the *eye* is the most expressive organ of the soul or mind of man, through which are shot forth, as it were into the visible world of the senses, the hidden passions, emotions, and desires of the nature, it is not strange that in the 'times of ignorance,' when men could give no rational or scientific account of almost any physiological phenomena, if connected with psychology, the eye should have been deemed a centre of malignant influence. The eye is, in fact, as potent as superstition dreams: the error lay not in the recognition of its power, but in explaining the mode of its operation. The person who felt himself under the spell of a powerful gaze, was too agitated to calmly consider the cause of his terrors, and attributed to another results for which mainly he himself was responsible. It was really he that gave to the eye of his fellow-creature its baleful influence; and he quailed less before the force of character which it indicated, than before the fearful fancies with which his own timidity had invested it. See FASCINATION BY SERPENTS.

EVINCE, *v.* *ě-vĩns'* [*F. évincer*—from *L. evincere*, to conquer completely—from *e*, out of; *vincō*, I conquer or vanquish: *It. evincere*—*lit.*, to conquer completely]: to

EVISCERATE—EVOLUTE AND INVOLUTE.

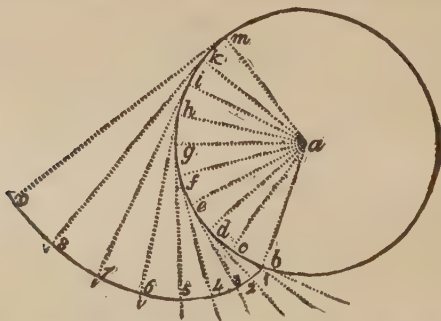
make evident; to prove beyond doubt; to show in a clear manner. EVIN'CING, imp. EVINCED', pp. -vinst'. EVIN'CIBLE, a. -sī-bl, capable of proof; demonstrable. EVIN'CIBLY, ad. -blī. EVINCE'MENT, n. act of evincing. EVIN'CIVE, a. -siv, tending to prove.

EVISCERATE, v. ě-vīs'sēr-āt [L. *eviscērātus*, disemboweled—from *e*, out of; *viscērā*, the bowels]: to take out the bowels or entrails of; to disembowel. EVIS'CERATING, imp. EVIS'CERATED, pp. EVIS'CERATION, n. -ā shūn.

EVITATE, v. ěv'ī-tāt [L. *evitātus*, avoided—from *e*, out; *vītō*, I shun]: in *OE.*, to shun; to avoid; to escape. EVITATING, imp. EVITATED, pp. -tā-tēd. EV'ITATION, n. -tā shūn, act of avoiding.

EVOKE, v. ě-vōk' [F. *évoquer*—from L. *evōcārē*, to draw forth—from *e*; *vōcō*, I call]: to call forth. EVO'KING, imp. EVOKED', pp. -vōkt'. EVOCATE, v. -kāt, to call out or forth. EVOCATION, n. ěv'ō-kā'shūn [F.—L]: the act of calling out.

EVOLUTE AND INVOLUTE: *Evolute* of any curve, the locus of the centre of its osculating circle: *Involute*, the curve relative to its evolute. This is the simplest definition of an evolute and involute, which are relative terms. There is another, however, which may represent the relation of the curves more clearly to those not mathematicians. If on any curve a string be closely wrapped, and if the string be fastened at one of its ends, and free at the other; and then if we unwind the string from the curve, keeping it constantly stretched, the curve which would be traced out by a pencil fixed to the free end of the string, is called the involute of that from which the string is unwound, and relative to it, the latter is called the evolute. It is clear that



the involute might otherwise be described by fastening a string at one extremity of the evolute, and wrapping it thereupon, keeping it always stretched. From either definition, it is clear that a normal to the involute at any point is a tangent to the evolute, and that the difference in length between any two radii of curvature to the involute is equal to the length of the arc of the evolute intercepted between

EVOLUTION—EVOLVE.

them. See CURVATURE; OSCULATING CIRCLE. The nature of evolutes was considered first by Huyghens, who showed that the evolute to a common cycloid is another equal cycloid, a property of that curve which he employed in making a pendulum vibrate in a cycloid. To describe the involute of a circle, proceed as follows: Let a be the centre of the circle, and b the extremity of the string to be unwound from its circumference. Divide the circle, or part of the circle, according to the length of curve required, into any number of equal parts, as c , d , e , etc.; through these, from a , draw radial lines; from the points where these touch the circle, draw, at right angles to the lines ac , ad , etc., other lines, as in the diagram. With the distance cb as radius from the point c , describe an arc $b1$, cutting the line $c1$ in 1. From the point d , with $d1$, describe an arc 1 2, cutting the line $d2$ in 2. From e , with $e2$, describe an arc 2 3, cutting the line $e3$ in 3. With radius $f3$, from f , describe an arc 3 4, cutting $f4$ in the point 4. Proceed in this way, describing arcs which pass through the points 5, 6, 7, 8, and 9. The involute will thus be formed.

EVOLUTION: see under **EVOLVE**.

EVOLU'TION AND INVOLU'TION: algebraical terms, the former signifying *the extraction of roots*, and the latter *the raising to powers*. When any number is multiplied by itself, the product is called its square, or second power. If we multiply the square by the number again, we get the cube, or third power; and so on: this process is called *involution*. Evolution is the inverse process, by which a number being presented, we may ascertain a particular *root* of it, say the fourth; or that number which, being multiplied into unity a particular number of times, say four times, the product will be the number presented: see **EXTRACTION OF ROOT**.

EVOLVE, *v.* *ě-vòlv'* [*L. ěvolvĕrĕ*, to roll out or forth—from *e*, out of; *volvo*, I roll]: to open and expand; to disentangle; to develop. **EVOL'VING**, *imp.* **EVOLVED'**, *pp.* *-vòlvĕd'*. **EVOLVENT**, *n.* *-ĕnt*, in *geom.*, the involute of a curve. **EVOLVER**, *n.* *-ĕr*, one who or that which evolves. **EVOLUTION**, *n.* *ěv'ò-lò'shŭn* [*F.—L.*]: the act of unfolding or unrolling; a series of things unfolded arising the one from the other; the gradual descent or development of forms of life from other pre-existing ones: the extraction of roots in *arithmetic* or *algebra*, thus, $\sqrt[3]{125}$ or $125^{\frac{1}{3}} = 5$, indicates that the number or root is to be found which, multiplied 3 times by itself, will produce 125—the opposite of *involution*, which see: in *milit.*, movement in order to a change in the arrangement and disposition of a body of soldiers in the field or at a review. All such movements as marching, counter-marching, route-marching, changing front, forming line, facing, wheeling, making column or line, making échelon or square, defiling, deploying, etc., come under the general heading of evolutions: see **TACTICS**, **MILITARY AND NAVAL**. Other things being equal, the best evolutions are those which occupy least time and least space. The word evolution applies equally to the movement of ships in

EVOLVULUS—EVORA.

a fleet. **EVOLUTION THEORY**, theory which maintains that the first created animals contained the germs of all future possible successors, successively included one within the other, and that generation is merely the act of unfolding the germ; the theory that every existing form of animal or plant life, even man himself, has been gradually produced or *evolved* during countless ages from one or two monads, or animalcules; the theory that each species of animal is not a special creation, but is gradually produced by the modification of others: see **DESCENT OF MAN**: **DARWINIAN THEORY**: **SPENCER, HERBERT**: **CREATIONISM**: **SPECIES**.—**EVOLUTIONAL**, a. *-l'shàn-ál*, connected with evolution. **EVOLUTIONARY**, a. *-ér-i*, pertaining to evolution. **EVOLUTIONISM**, n. *-izm*, theory or doctrine of evolution. The term was introduced by Prof. Huxley in his presidential address to the Geological Society 1869. With it he introduced the terms Catastrophism and Uniformitarianism, the three words being designed to discriminate the three chief schools of geological thought. **EVOLUTIONIST**, n. *-ist*, one holding the doctrine of evolution, as distinguished from that of uniformity and that of successive catastrophes.

EVOLVULUS, n. *ē-vòl'vū-lūs* [L. *evolveo*, I roll out; not twining, as opposed to *Convolvulus*, which twines]: a genus of *Convolvulaceæ*. It has entire, nearly sessile leaves, and small flowers. About 60 species are known, chiefly from tropical America.

EVORA, *ēv'o-râ* (ancient *Ebora*): city of Portugal, cap. of the province of Alemtejo, and, after Coimbra, and perhaps Thomar, the most interesting city in the country; beautifully situated on a fertile and elevated plain, 48 m. w.s.w of Badajoz, about 80 m. e. of Lisbon. It was formerly a place of considerable strength; but its ramparts, and the towers which flanked them, its citadel, its forts, and its watch-towers, are now in hopeless ruin. The town itself is not well built, its streets are narrow and winding, and its houses old and badly planned. It has a cathedral, a large Gothic edifice, founded 1186, the choir of which, rebuilt 1721, is in the Italian style, and is richly adorned with marbles of various colors. E. has been the see of an archbishop since 1541; has an archiepiscopal library containing more than 50,000 vols.; and several pictures of great merit, attributed to Gran Vasco. It has manufactures of ironware and leather, and a well-attended annual fair. Pop. about 12,000.

E. is a very ancient city. Quintus Sertorius took it B.C. 30. It was conquered also by the Moors A.D. 712, but retaken from them 1166. The Roman antiquities of E. are unrivalled in the Peninsula. Among these, the temple of Diana, used as a slaughter-house for some time previous to 1834, exhibits in its fine Corinthian columns admirable proportion and delicacy of sculpture. There is also an aqueduct, 1,200 paces in length, erected by Quintus Sertorius; but the most beautiful Roman relic, and one of the most perfect pieces of ancient architecture extant, is the tower which rises in the city at the extremity of the aque-

EVOSMIA—EVREUX.

duct. It is 12 ft. 6 inches in diameter, and is surrounded by eight columns of the Ionic order. Ionic pilasters decorate the second story, and the top is crowned with a hemispherical dome. It is wholly of brick, and covered with cement of such a durable nature, that, though this delicate structure has stood since B.C. 70, few parts of it seem impaired by time.

EVOSMIA, n. *ē-vōs'mī-a* [Latinized form of Gr. *euosmos*, sweet smelling, fragrant; *eu*, well, good; *osmē*, smell]: genus of cinchonads, tribe *Cinchonæ*, family *Hamelidæ*. It has red flowers and sweet-smelling berries. *Evosmia corymbosa* is poisonous.

EVOVÆ, n. *ē-vō'vā-ē*: in *mus.*, artificial word, consisting of the vowels in *Seculorum Amen*, at the end of the *Gloria Patri*. It was designed to serve as a mnemonic word to enable singers to render the several Gregorian chants properly; each letter in Evovæ standing for the syllable whence it was extracted. The author of the article in Smith's *Christian Antiquities* says that the Evovæ must be regarded as containing the germ of the present accepted views respecting musical accent. A modern imitation of the word was proposed by Mr. Dyce, but never came into use. It remains a mere curiosity, inasmuch as more obvious means exist of expressing accent.

EVREMOND, *āv-mōng'*, CHARLES MARGOTELLE DE ST. DENIS, Seigneur de St.: 1613, Apr. 1—1703, Sep.; b. at St. Denis le-Guast, Normandy: author and wit. He entered the army about the age of 15, became an ensign in less than a year, and 1637 had the command of a company of foot. About this time, he gained the favor and friendship of Turenne, Grammont, the Prince of Condé, and others of high rank, all of whom were delighted with his wit and cheerfulness. Having talked himself into the esteem of these men, it was not long until, by the same means, he brought himself under their displeasure. In 1661 his unbridled indulgence in raillery compelled him to take refuge in England. Many attempts were made at the French court to induce Louis XIV. to recall St. E., whose accomplishments, gayety, and wit rendered him the delight of all who had not smarted from his sarcasm; but Louis remained immovable until 1689, when he granted the exile permission to return. It was now, however, too late. St. E. had by this time surrounded himself with an admiring circle of the wits and beauties of the English court, and resolved to remain where he was. He died in his 91st year. St. E.'s works, comprising comedies, classical essays, etc., were correctly published first by Des Maizeaux, with a life of the author (Lond. 1704): they are translated into English by the same editor.

EVREUX, *ēv-rüh'* (anciently *Mediolanum*, and more recently *Ebuironices*): episcopal city of France, dept. of Eure, of which it is cap.; pleasantly situated in a valley on the Iton, a feeder of the Eure, 60 m. w.n.w. of Paris. It is well built, its streets regular, and the environs prettily laid out in promenades, gardens, and vineyards. The principal

EVULGATION—EWALD.

building of E. is the cathedral, which dates from the 11th c. Other buildings of note are the abbey church of St. Thaurin, originally built over the tomb of St. Thaurin, first bishop of E., and having a shrine executed in the 13th c., which formerly contained his relics; the Bishop's Palace, built 1484; and the *Tour de l'Horloge* of the same century. E. has extensive manufactures of bed-ticking, woollen stuffs, cotton-yarn, leather, vinegar, and a trade in its manufactures, and in grain, seeds, timber, and liqueurs.—E. is remarkable for the numerous sieges which it has sustained. It was taken by Clovis from the Romans; was sacked and plundered 892 by the Northmen, under Rollo; was burned by Henry I. of England 1119; and twice captured (1194 and 99) by Philippe Auguste, King of France, into whose hands, after a short time, it permanently came. It was frequently taken and recovered in the wars between France and England during the reigns of Henry V. and Henry VI. of the latter country.—Pop. 12,000.

VIEIL EVREUX (*Old Evreux*), village near E., supposed site of the anc. Mediolanum, has some ancient remains of a theatre, an aqueduct, and fortifications.

EVULGATION, n. *ē-vŭl-gŭ'shŭn* [L. *evulgatus*, pp. *ŏ' evulgo*, I make common or public]: act of publishing, making known, or divulging.

EVULSION, n. *ē-vŭl'shŭn* [L. *evulsio*nem, a pulling out—from *e*, out of; *vulsus*, plucked]: the act of plucking out.

EWALD, *ā'vālt*, GEORG HEINRICH AUGUST VON: 1803, Nov. 16—1875, May; b. Göttingen; distinguished orientalist. He showed predilection for Oriental literature even in his school-days. He studied at the univ. of his native place, and while a student wrote *Die Composition der Genesis* (Braunsch. 1823). In 1823, he became a teacher at the Wolfenbüttel gymnasium; in 1827, extraordinary, and in 1831, ordinary, prof. of philosophy at Göttingen; in 1835, was appointed nominal prof. of the Oriental languages. Travels in search of Oriental mss. led him, in 1826, 29, and 36, to Berlin, Paris and Italy. After the death of Eichhorn, the critical exegesis of the Old Testament was included in his duties as prof. The first, and perhaps the most important fruit of his new labors, was his Critical Grammar of the Hebrew Language (*Kritische Grammatik der Hebr. Sprache*, Leip. 1827), an abridgment of which was published Leipsic 1835 (*Grammatik der Hebr. Sprache*; 5th edit. 1844); and a still simpler epitome 1842 (*Hebr. Sprachlehre für Anfänger*). Before this, however, E. had acquired high reputation by his work on Canticles (*Hohe Lied Salomo's*, Gött. 1826); his Commentary on the Apocalypse (*Commentarius in Apocalypsin*, Leip. 1828); his Poetical Books of the Old Testament, 4 vols. (*Die Poetischen Bücher des Alten Bundes*, Gött. 1835-37); and his Prophets of the Old Testament, 2 vols. (*Die Propheten des Alten Bundes*, 2 Bde., Stutt. 1840). Between 1843-50, E. published an important work in 4 vols., on the History of the People of Israel until the Time of Christ (*Geschichte des Volkes Is-*

EWALD.

rael bis auf Christus; Eng. trans. 1869-74), and a subsidiary vol. on the Antiquities of the People of Israel (*Die Alterthümer des Volkes Israel*). The *Geschichte des Volkes Israel*, together with its two continuations, The History of Christ and his Time (*Geschichte Christus und seiner Zeit*, 1857), and The History of the Apostolic Age, etc. (*Geschichte des Apostolischen Zeitalters bis zur Zerstörung Jerusalems*, 1858), is regarded as E.'s greatest work. But Jewish history and literature did not limit the sphere of E.'s wonderful activity. His lectures at Göttingen embraced the literature of the Arabic, Persian, Aramaic, and Sanskrit tongues, and gave birth to such works as that on the Metres of the Arabian Songs (*De Metris Carminum Arabicorum*, Leip. 1825); on Some of the Older Sanskrit Metres (*Ueber einige ältere Sanscrit-Metra*, Gött. 1827), an epitome of the Arabic author Wakidi's work on Mesopotamia (*De Mesopotamiae expugnate Historia*, Gött. 1827), and a Grammar of Arabic, entitled *Grammatica Critica Linguae Arabicæ cum brevi Metrorum Doctrina*, 2 Bde. (Leip. 1831-33). In 1832, E. published at Göttingen several very important Dissertations on Oriental and Biblical Literature (*Abhandlungen zur orient. und biblischen Literatur*), and planned the well-known periodical, Journal for the Knowledge of the East (*Zeitschrift für die Kunde des Morgenlands*). E. was not only a scholar and philologist, but a man of strong political convictions. Having, with six of his colleagues (the brothers Grimm, Dahlmann, Gervinus, Weber, and Albrecht), protested against the abolition of constitutional law and liberty in Hanover by the new sovereign, Ernest Augustus (previously Duke of Cumberland), he was dismissed from his situation, 1837, Dec. 12, and went to England to investigate its public libraries, whence he was called to Tübingen 1838, as prof. of theology. Here he remained ten years. In 1841, he was ennobled by the king of Würtemberg. In 1848, E. returned to Göttingen, where he established a Year-book of Biblical Science (*Jahrbuch der biblischen Wissenschaft*), in which, as well as in his work on the Synoptic Gospels (*Die drei ersten Evangelien*, Gött. 1850), and works on the Epistles of Paul (*Die Sendschreiben des Apostels Paulus übersetzt und erklärt*, Gött. 1857), he strove to give a firmer basis to New Testament criticism and exegesis. E. also gave great attention to Ethiopic literature, a result of which is his valuable Dissertation on the Book of Enoch (*Ueber des Äthiopischen Buches Henoch Entstehung*, etc., Gött. 1856). Later works were *Das Sendschreiben an die Hebräer und Jacob's Rundschreiben* (1871); and *Sieben Sendschreiben des Neuen Bundes* (1871). The distinguishing peculiarity of E., as theologian and critic, was his love for the concrete forms in which divine truths are revealed in history, and his dislike of the abstractions into which they are refined away by over-speculative theologians. He regarded it as the especial glory of the Jewish people, that they never lost sight of the concrete—as the Persians and Hindus, for example, did, with whom the realities of religion vanished into the most intangible dreams—but kept it ever before them until, in the fullness of

EWALD—EWE-GOWAN.

times, there was born among them Jesus of Nazareth, the Perfect and Only One, in whom humanity reached its spiritual consummation. E. refused to class himself or to be classed with any theological party in Germany. He was equally opposed to the extreme left represented in Tübingen, and to the extreme right represented in the modern Lutheran movement headed by Hengstenberg. When Hanover was in 1866 incorporated with Prussia, E. declined to take the new oath of allegiance, and was accordingly required to retire from the functions of the professoriate. He returned to political life; and as the three times elected representative of the town of Hanover in the Reichstag, persistently opposed the new political conditions.

EWALD, *ä'vâld* or *ä'vâl*, JOHANNES: 1743, Nov. 18—1781; b. and d. in Copenhagen: lyric poet of Denmark. In his 16th year, when his friends were about to send him to the Univ. of Copenhagen, his impatience of restraint led him to escape to Germany, where he entered as a private soldier in the army of Frederick the Great of Prussia, from which he soon deserted to the Austrians. His bravery having attracted the notice of his superiors, he was offered a commission, which he refused, as it would have obliged him to become a Rom. Cath.; and having induced his friends to purchase his discharge, he returned to Copenhagen 1760, after having taken part in the great campaigns of 1759–60. He then began the study of theology, but a disappointment in love turned him toward poetry. His funeral ode on the death of Frederick V. of Denmark, 1767, showed original genius, and gave him rank among the best writers of his country. This was followed by numerous tragedies, operas, and songs, remarkable for lyrical beauty. In 1770, appeared the prose tragedy of *Rolf Krage*. Although *Balder's Doed* (1773), which breathes the heroic spirit of the ancient bards of the north, and exhibits the specially national tendency of E.'s genius, is regarded by some critics as his *chef-d'œuvre*, *Fiskerne*, 'The Fishermen' (1780), probably deserves to rank equally high, when considered as a mere lyrical production. His habits of dissipation, and his decided political opinions brought him into difficulties of every kind, while his infirmities of temper, and irregularities of conduct, estranged the affection of his nearest relatives, and in the latter years of his unhappy life he was often indebted to strangers for subsistence. Some of his nautical songs have been raised to the dignity of national odes. He was engaged at his death in compiling an autobiography, and the complete edition of his writings, which appeared 1792. His works have been edited by F. L. Liebenberg (Copen. 1850–55); and a life compiled from unpublished materials, has recently appeared from the pen of F. C. Olsen, of Copenhagen.

EWDEN-DRIFT: see EWIN-DRIFT.

EWE, n. *û* [AS. *eowu*; Dut. *ouwe*, a female sheep: Gr. *oîs*; L. *ovis*, a sheep]: a female sheep.

EWE-GOWAN, n. *-gow'an*: in *bot.*, the common daisy (*Bellis perennis*).

EWELL--EWING.

EWELL, *yô'el*, RICHARD STODDERT: 1817, Feb. 8—1872, Jan. 25; b. Georgetown, D. C.; soldier. He graduated at the U. S. Milit. Acad. 1840, served in the 1st U. S. dragoons at Contreras and Churubusco, Mexico, 1847, Aug.; became capt. 1849, Aug. 4; was in the campaign against the Apache Indians in N. Mex., 1857, June; resigned his commission 1861, and entered the Confederate army as lieut.col. He took part in the engagements and battles at Blackburn's Ford, 1861, July 18; Bull Run, July 21; Warrenton turnpike (where he lost a leg), 1862, Aug. 28; Front Royal, Cross Keys, Port Republic, and Cedar Mountain; and (as lieut.gen. and commander of the 2d corps of Gen. Lee's army after the death of Gen. 'Stonewall' Jackson), Winchester, Gettysburg, the Wilderness, and Spottsylvania Court-house. Subsequently he was relieved from field duty on account of disabilities, given command of the dept. of Richmond, and captured with his entire force by Gen. Sheridan at Sailor's Creek, 1865, Apr. 6. He afterward settled in Springfield, Tenn.

EWER, *n. u'ér* [*F. aiguère*, a water-vessel—from *L. aqua*; *OF. aigue*, water: *OF. eanier*, a gutter]: the large jug belonging to a wash-hand basin; a water-jug; a pitcher. **EWRY**, *n. ū'ri*, an officer of the royal household who takes care of the table linen, and serves up water in ewers after dinner.

EWIN-DRIFT, *n. ū'in-drift* [*etym. doubtful*]: snow driven by the wind; a snow-drift.

EWING, *yô'ing*, FINIS: 1773, July 10—1841, July 4; b. Bedford co., Va.: Cumberland Presb. clergyman. He settled near Nashville, Tenn., on the death of his parents; was licensed to preach 1800, and was ordained a Presb. clergyman by the Cumberland Presbytery 1803. The synod of Ky. refused to recognize his ordination, and was sustained by the Presb. gen. assembly; whereupon with two others he organized the Cumberland Presb. Church, 1810. He preached in Todd co., Ky.; Cooper co., Mo., and at Lexington, Mo., till his death; and was author of *Lectures on Divinity*, in which he formulated the tenets of the new denomination.

EWING, THOMAS, LL.D.: 1789, Dec. 28—1871, Oct. 26; b. near West Liberty, Va.: lawyer. He removed with his parents to O. 1792; was taught the early branches by an elder sister, prepared himself for college while working in the Kanawha salt factory, cleared his father's farm from debt with his own earnings, and graduated at O. Univ., Athens, 1815. In the following year he was admitted to the bar and practiced with success till 1831, when he was elected U. S. senator as a whig. On the expiration of his term he resumed practice. In 1841, he was appointed sec. of the U. S. treas., and 1849 sec. of the new dept. of the interior, which he organized. On the appointment of Thomas Corwin as sec. of the treas. 1850, E. was appointed to succeed him in the U. S. senate, served there about a year, and then retired from public life. He resumed practice at Lancaster, O., and became one of the foremost prac-

EWING--EXACUM.

tioners before the U. S. supreme court. E. adopted Gen. William T. Sherman when 9 years old, appointed him to the U. S. Milit. Acad., and gave his daughter to him in marriage 1850.

EWING, THOMAS, Jr.: lawyer and soldier: b. Lancaster, O., 1829, Aug. 7. He was educated at Brown Univ., was private sec. to President Taylor 1849-50, studied law in Cincinnati, and was admitted to the bar, removed to Leavenworth, Kan., 1856, was a member of the constitutional convention 1858, and the first chief-justice of the state 1861-2. In 1862 he recruited the 11th Kan. vols.; was elected its col.; took part in the battles of Fort Wayne, Cane Hill, and Prairie Grove; was commander of the Mo. and Ark. border dist.; held Pilot Knob with 1,000 men against several attacks by Confederates under Gen. Sterling Price 1864, Sep.; was promoted brig.gen. 1863, Mar. 13, and brevetted maj.gen. of vols. 1865. He was a member of congress from O. 1877-81, and the unsuccessful candidate for gov. 1879; and since 1882 has resided and practiced law in New York. He d. 1896, Jan 1.

EWT: see EFT, or NEWT.

EX, prefix, *ěks* or *ěgz* [L. and Gr. *ex*; Gr. *ek*]: out of; out; off; from; without; denoting merely increase of the power of the simple word. EX assumes the forms E, Ec, Ef, according to the letter commencing the word of which it forms the prefix. EX prefixed to the name of an office denotes that the person formerly held the office named, or does not now hold it, as *ex-mayor*, *ex-minister*. EX OFFICIO, *ěks ǒf-f'ish'ĭ-ō* [L. *ex*, from; *officio*, office]: by virtue of office. EX PARTE, *ěks pâr'tē* [L. *ex*, from; *parte*, a part or side]: partial.

EXACERBATE, v. *ěks-ăš'ěr-băt* [L. *exacerbātus*, provoked, irritated—from *ex*, out of; *acerbus*, bitter, harsh]: to exasperate; to inflame angry passions; to irritate highly. EXACERBATING, imp. EXACERBATED, pp. EXACERBATION, n. *-bă shûn* [F.—L.]: the act of irritating highly; the irritation itself; increase of violence in a disease; also EXACERBESCENCE, n. *-bēs'ěns*.

EXACT, a. *ěgz-ăkt* [F. *exact*—from L. *exactus*, demanded, required—from *ex*, out of; *actus*, done, driven]: very correct or regular; accurate; precise; punctual; methodical; particular; careful; nice. EXACT', v. [OF. *exacter*, to extort—from mid. L. *exactāre*, to exact—*lit.*, to drive out]: to force to pay or yield; to demand or require authoritatively; to extort. EXACT'ING, imp.: ADJ. harsh; severe; unyielding; compelling to pay or give. EXACT'ED, pp. EXACTEE or EXACTOR, n. *-tēr*, one who exacts. EXACT'ION, n. *-ăk'-shûn* [F.—L.]: the act of demanding with authority; that which is exacted; extortion. EXACT'NESS, n. *-ăkt'nēs*, accuracy; regularity. EXACT'LY, ad. *-lĭ*. EXACTITUDE, n. *ěgz-ăk'tĭ-tūd* [F.—L.]: exactness; accuracy.

EXACUM, n. *ěgs'a-kūm* [L. *ex*, out; *ago*, I drive; because the plant is said to have the power of expelling

EXÆRESIS—EXAMPLE.

poison]: genus of gentians, tribe *Gentianeæ*. The old *Exacum filiforme* is now *Cicendia filiformis*.

EXÆRESIS, n. *ĕgz-ĕ'rĕ-sĭs* [Gr. *exaireō*, I take away, I remove; *ex*, out, away; *haireō*, I take]: in *surg.*, that branch of surgery which relates to the removing of parts of the body.

EXAGGERATE, v. *ĕgz-ăj'ĕr-ăt* [L. *exaggĕrātus*, increased by heaping up—from *ex*, out of; *agger*, a heap: It. *esagerare*: F. *exagĕrer*]: to enlarge beyond the truth; to color highly; to tell more than the truth. **EXAG'GERATING**, imp. **EXAG'GERATED**, pp. **EXAG'GERA'TION**, n. *-ă'shŭn* [F.—L.]: telling more than the truth; hyperbolical representation. **EXAG'GERATORY**, a. *-tĕr-ĭ*, containing exaggeration.

EXALBUMINOSE: same as **EXALBUMINOUS**.

EXALBUMINOUS, a. *ĕks'ăl-bŭ'mĭ-nŭs* [L. *ex*, out of, and *albumen*]: in *bot.*, applied to a seed which has no distinct albumen, or none but what is contained within the cotyledons themselves.

EXALT, v. *ĕgz-awl't* [F. *exalter*, to exalt—from L. *exaltāre*, to raise, to elevate—from *ex*, out of; *altus*, high: It. *esaltare*]: to raise high; to elevate in power, wealth, dignity, or fame; to elevate the tone of, as the voice; to magnify; to extol. **EXAL'TING**, imp. **EXAL'TED**, pp. **EXALTATION**, n. *ĕgz'awl-tă-shŭn* [F.—L.]: the act of exalting; elevated state; state of greatness or dignity. **EXAL'TEDNESS**, n. **EXALTER**, n. *-ĕr*, one who exalts.—**SYN.** of 'exalt': to raise; elevate; erect; hoist; lift; heighten; dignify; promote; glorify; inspire; elate.

EXAMINE, v. *ĕgz-ăm'in* [F. *examiner*—from L. *examĭnāre*, to try, to try by weight: It. *esaminare*]: to inspect carefully with a view to discover the real state of; to search or inquire into; to try by experiment, rule, or law; to scrutinize; to test the qualifications of by questions. **EXAM'INING**, imp. **EXAM'INED**, pp. *-ĭnd*. **EXAM'INABLE**, a. *-ă-bl*, that may be inquired into. **EXAM'INER**, n. one who. **EXAM'INATOR**, n. *-tĕr*, one who. **EXAM'INA'TION**, n. *-ă'shŭn* [F.—L.]: careful observation or inspection; investigation; scrutiny by study or experiment; research; test of knowledge by questions. **EXAMEN**, n. *ĕgz-ă'mĕn* [L. that which examines, the tongue of a balance]: examination; the tongue on the beam of a balance, rising perpendicularly from it. **CROSS-EXAMINATION**, in *law*, the examination of a witness by the opposite party, with the view of shaking his evidence formerly given. **EXAMINATION OF A BANKRUPT**: see **BANKRUPTCY**.—**EXAMINATION OF A PRISONER**, in *Scotland*: see **DECLARATION**.—**EXAMINATION OF A WITNESS**: see **EVIDENCE**.—**EXAMINATION FOR THE PUBLIC SERVICE**: see **CIVIL SERVICE**.—**SYN.** of 'examination': search; inquiry; scrutiny; inspection; exploration; exploitation; inquisition; discussion; debate.

EXAMPLE, n. *ĕgz-ăm'pl* [F. *exemple*; OF. *example*—from L. *exemplum*, a model or copy, a sample: It. *esempio*]: a pattern, copy, or model; a specimen; one as an illustration

EXANGIA—EXARCH.

of the whole; a former instance; that which, or the person who, is proper for imitation; one punished for the warning of others; an illustration of a rule or precept.—**SYN.**: instance; illustration; copy; case; sample; precedent; exemplification; warning; caution.

EXANGIA, n. *ěks-ăn'jì-a* [Gr. *ex*, out; *angeion*, a vessel for holding liquid, a vein]: in *pathol.*, a term applied to the excessive distension of a large blood-vessel.

EXANIMATE, a. *ěgz-ăn'î-mūt* [L. *ex*, *anîma*, life, spirit]: destitute of life; spiritless: **V.** to render destitute of life or animation; to dishearten. **EXAN'IMATING**, imp. **EXAN'IMATED**, pp.

EX ANIMO, phrase, *ěks-ăn'î-mō* [L.]: from the soul.

EXANNULATE, a. *ěks-ăn'nū-lāt* [L. *ex*; Eng. *annulate*]: in *bot.*, not having an annulus or ring around the spore-cases. Used of certain ferns. Of the three orders of Filicales, two, *Ophioglossaceæ* and *Danæaceæ*, are ringless, and one, *Polypodiaceæ*, is ringed.

EXANTHALOSE, n. *ěks-ăn'tha-lōs* [Gr. *exanthēō*, I put out flowers; *hals*, salt]: white efflorescence such as results from the exposure of Glauber's salt. Composition: sulphuric acid 42·5 to 44·8; soda 33·4 to 35; water 18·8 to 20·2. Found in Vesuvian lavas and at Hildesheim.

EXANTHEMA, n. *ěks-ăn-thē-mā* [Gr. *exanthēmāi*, a blossom, an eruption—from *ex*, out of; *anthos*, a flower]: in *med.*, an eruption—one of a class of contagious febrile diseases (see **FEVER**) attended by distinctive eruptions on the skin, appearing at a definite period, and running a recognizable course. To this class belong small-pox, chicken-pox, measles, scarlet fever, and according to some authorities, plague, typhus, erysipelas, etc. **EXANTHE'MATA**, n. plu. *-thē-mā-tā*. **EX'ANTHEMATOUS**, a. *-thē-mā-tūs*, pertaining to. **EXANTHEMATOLOGY**, n. *ěks-ăn-thē-ma-tōl'ōjī* [Gr. *exanthēma*; *logos*, a discourse]: department of medical science which treats of exanthemata or eruptions. **EXANTHESIS**, n. *ěks-ăn-thē'sis* [Gr. *exanthēsis*, efflorescence, eruption]: in *med.*, nearly the same as exanthema; but exanthesis refers chiefly to the process of breaking out, and exanthema to that which breaks out, the character of the eruption after it has been formed.

EXANTLATE, v. *ěks-ănt'lāt* [L. *exantlatus*, pp. of *exantlo*, I draw out, I suffer; Gr. *exantlēō*]: to draw out: to exhaust; to wear out; to waste away.

EXARCH, n. *ěks'ărk* [Gr. *exar'chōs*: L. *exar'chūs*: F. *exarque*—from Gr. *archē*, source, authority]: a viceroy; applied specially to viceroy under the Eastern emperors; an official in Greek churches. **EXAR'CHATE**, n. *-ăr'kāt*, dignity of an exarch; department governed by him.—*Exarch* was the title conferred first by Justinian on his commander-in-chief and vicegerent in Italy. The conquest of Italy by the Goths in the early part of the 6th c. was a severe blow to the Byzantine pride; and Justinian determined to wipe out the disgrace, and recover the imperial territories. The execution of this project was intrusted first to Belisarius (q. v.),

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afterward to Narses (q. v.), by whom the reconquest of Italy was effected. The latter was the first who bore the title of exarch; and the district over which he ruled was called the *Exarchate*. The seat of the exarch was Ravenna, the different towns and territories belonging to them being governed by subordinate rulers, styled *Duces* or Dukes. The extent of the exarchate, however, was gradually diminished, until it embraced only the country about Ravenna, the present Romagna, and the coasts of Rimini as far as Ancona. This was brought about partly by the conquest of the Longobards, partly by the dukes of Venice and Naples making themselves independent. In 728, even this small portion fell, for a short time, into the hands of the Longobards. In 752, Astulf, or Astolphus, King of the Longobards, put an end to the Byzantine rule at Ravenna; but in 755, he was compelled to resign the exarchate to Pepin the Less, King of the Franks, who gave it over to the Bp. of Rome, Stephanus II.—In the Christian Church, exarch was originally a title of the bishops, afterward of a bishop who presided over several others—a primate. It was borne by the bishops of Alexandria, Antioch, Ephesus, Cæsarea, and Constantinople, till it was finally exchanged for the title of Patriarch. A superior over several monasteries was also called in ancient times an exarch. The same title is borne, in the modern Greek Church, by the person who ‘visits’ officially, as a sort of legate of the patriarch, the clergy and churches in a province.

EXAREOLATE, a. *ěks-ăr-ě-o-lăt* [L. *ex*, *areola*, a small open place]: in *bot.*, not spaced out.

EXARILLATE, a. *ěks-a-ril'lăt* [L. *ex*; Eng. *arillate*]: in *bot.*, not having an aril.

EXARISTATE, a. *ěks-a-ris'tăt* [L. *ex*; *aristatus*, having awns]: in *bot.*, not having an arista, an awn, or a beard.

EXASPERATE, v. *ěgz-ăs'pěr-ăt* [L. *exaspērātus*, roughened, stirred up—from *ex*, out of; *asper*, rough: It. *exasperare*: F. *exaspérer*]: to irritate to a high degree; to excite to great anger; to enrage or provoke greatly: **ADJ.** in *bot.*, clothed with hard, stiff, short points **EXAS'PERATING**, imp. **EXAS'PERATED**, pp. **EXAS'PERA'TION**, n. *-ă shŭn* [F.—L]: the act of exciting to violent anger; an extreme degree of anger. **EXASPERATER**, n. *-tér*, one who exasperates, irritates, or provokes.—**SYN.** of ‘exasperate’: to aggravate; irritate; provoke; enrage; incite; inflame; imbitter.

EXCÆCARIA, n. *ěks-sē-kăr'ĭ-a* [L. *excæco*, I make blind, which the juice of the plant is said to do, while even the smoke is deleterious to the eyes]: in *bot.*, genus of *Euphorbiacæ*, tribe *Hippomanææ*. *Excaecaria* *Agallocha* received its specific name from the erroneous belief that it produced the agalloch or aloes wood.

EXCAMB, n. *ěks'kăm* [mid. L. *excambiūrē*, to exchange]: in *Scots law*, an exchange of one piece of land for another; also **EXCAM'BION**, n. *-bĭ-ŏn*, and **EXCAM'BIUM**, n. *-bĭ-ŭm*. **EXCAMB'**, v., and **EXCAM'BIE**, v. *-kĭm'bĭ*, to exchange one piece of land for another. See *Bell's Law Dictionary*.

EXCARNATE—EXCENTROSTOMATA.

EXCARNATE, v. *ěks kâr'nât* [mid. L. *excarnātus*, stripped of flesh—from L. *ex*, out of; *carnem*, flesh]: to deprive or clear of flesh. **EXCAR NATING**, imp. **EXCAR'NATED**, pp. **EXCAR'NIFICA'TION**, n. *-nĭ-fĭ-kā-shŭn* [L. *faciō*, I make]: the act of depriving of flesh.

EX CATHEDRA, a. or ad. *ěks' kă-thē'dră* [L. *ex*, from; *cathēd'ra*; Gr. *kathēd'rā*, a chair]: with authority or dogmatism, in allusion to a professor or teacher; with an air of official authority.

EXCAVATE, v. *ěks'kă-văt* [L. *excāvātus*, hollowed out—from *ex*, out of; *cāvūs*, hollow]: to scoop or dig out; to hollow. **EX'CAVATING**, imp. **EX'CAVATED**, pp. **EX'CAVATER**, n. *-vā-tēr*, one who; a machine for cutting into rocks. **EX'CAVA'TION**, n. *-shŭn* [F.—L.]: a hollow cavity or pit formed by digging out earth; the act of digging out earth.

EXCEED, v. *ěk-sēd'* [F. *excéder*—from L. *excēdērē*, to go out, to withdraw—from *ex*, out of; *cēdō*, I go; It. *eccedere*]: to pass or go beyond; to excel; to surpass; to go too far; to go beyond any given limit. **EXCEEDING**, imp.: **ADJ.** great in extent or duration; very large: **AD.** in a very great degree. **EXCEED'ED**, pp. **EXCEED'INGLY**, ad. *-lĭ*, very; unusually, to a very great degree.

EXCEL, v. *ěk-sěl'* [F. *exceller*—from L. *excel'lēre*, to be high, to be eminent—from L. *ex*, cello, I impel or urge on; It. *eccellere*]: to surpass; to possess good qualities in a great degree; to do anything in a superior manner. **EXCEL'LING**, imp. **EXCELLED'**, pp. *-sēld'*. **EX'CELLENCE**, n. *-lēns*, state of excelling; any valuable quality; also **EX'CELLENCY**, n. *-sĭ*. **EX'CELLENCY**, n. *-lēn-sĭ*, a title of honor now given to viceroys, also to ambassadors, as representing not the affairs alone, but the persons of sovereign princes, to whom it was formerly applied. The privilege of being addressed as 'Your Excellence,' and of demanding a private interview with the prince to whom he is accredited, are the chief distinctions between the privileges of an ambassador, and an envoy or minister plenipotentiary: see **AMBASSADOR**: **EMBASSY**. **EX'CELLENT**, a. *-lēnt*, of great virtue, worth, or quality; highly useful; prime; select; highly desirable. **EX'CELLENTLY**, ad. *-lĭ*.—**SYN.** of 'excellence': superiority; worth; perfection; goodness; greatness; purity; eminence; —of 'excellent': worthy; valuable; choice; exquisite; distinguished; admirable; superior; excessive.

EXCELSIOR, a. *ěk sěl'sĭ-ōr* [L. *excelsus*, lofty; *excelsiōr*, loftier]: more lofty; more elevated; higher still. **EXCEL'SITUDE**, n. *-tūd* [L. *excelsus*, high, lofty]: height.

EXCENTRIC, n. *ěk-sĕn'trik* [see **ECCENTRIC**]: a wheel having the axis removed from the centre: **ADJ.** deviating from the centre; removed from the centre or axis. **EXCENTRAL**, a. *ěks-sĕn'tral*, in *bot.*, out of the centre. **EXCENTRICAL**, a.: same as **ECCENTRIC**. **EXCENTRICITY**: same as **ECCENTRICITY**.

EXCENTROSTOMATA, n. *ěk-sĕn-tro-stōm'a-ta* [Gr. *ekkentros*, out of the centre; *stoma*, mouth]: in *zool.*, name

EXCEPT—EXCHANGE.

given by De Blainville to a family of *Echinida*, with a more or less elongate, cordate body. Chief genera, *Spatangus* (recent), and *Annachites* (fossil).

EXCEPT, v. *ěk-sěpt'* [OF. *excepter*—from L. *exceptāre*, intensive of *excipĕrĕ*, to withdraw—from *ex*, out of; *cūpiō*, I take: F. *exciper*]: to pass over; to take or leave out of any specified number; to object; to exclude. **EXCEPTING**, imp.: **PREP.** without including; to the exclusion of. **EXCEPTED**, pp.: **ADJ.** left out; specially excluded. **EXCEPT**, conj. unless; without: **PREP.** exclusive of; not including; save; but. **EXCEPTION**, n. *-sěp'shūn* [F.—L.]: the act of excluding or leaving out of a certain number; that which is excluded or separated from others; the person or thing not included; an objection; dislike; slight offense taken; a saving clause in a formal writing. **EXCEPTION-ABLE**, a. *-ă-bl*, liable to objection. **EXCEPTIONAL**, a. *-ăl*, forming an exception. **EXCEPTIVE**, a. *-tĭv*, including an exception. **EXCEPTOR**, n. *-tĕr*, one who. **EXCEPTLESS**, a. in *OE.*, usual; that has not an exception. **EXCEPTION PROVES THE RULE**, the very fact of exceptions shows there must be a rule.

EXCERNENT, a. *ěk-sĕr'nĕnt* [L. *ex*, out of; *cernen'tem*, separating, sifting]: in *med.*, connected with excretion.

EXCERPT, v. *ěk-sĕrpt'* [mid. L. *excerptum*, a picking, an extract—from *ex*, out of; *carpo*, I pluck or take]: to select parts of any writings: **N.** an extract or selection from a writing. **EXCERPTA**, n. *-a*, excerpts, extracts. **EXCERPTING**, imp. **EXCERPTED**, pp. **EXCEPTION**, n. *ěk-sĕrp'shūn*, an extract.

EXCESS, n. *ěk-sĕs'* [OF. *excez*, superfluity, excess—from L. *excessus*, retiring, withdrawing—from *ex*, out of; *cessus*, gone, departed: comp. *ex*, out of; Eng. *cess*, rate, measure—*lit.*, out of all measure]: a passing or going beyond a certain measure or limit; more than enough; intemperance; difference between things unequal. **EXCES'SIVE**, a. *-sĭv*, being in excess; beyond any given measure or limit; unreasonable; extreme. **EXCES'SIVELY**, ad. *-lĭ*, in a great degree; exceedingly. **EXCES'SIVENESS**, n. the state or quality of being excessive.—**SYN.** of 'excess': superfluity; redundancy; super-abundance; immoderateness; dissipation; remainder.

EXCHANGE, v. *ěks-chānj'* [F. *échanger*; OF. *eschanger*, to exchange, to barter—from L. *ex*, out of; F. *changer*, to change]: to give one thing for another; to barter; to resign or lay aside one state or condition and take another instead of it; to give and receive the like thing: **N.** the act of giving one thing or commodity for another; barter; the act of giving up one condition or state for another; a place where merchants meet, or the meeting itself—in this sense often written 'CHANGE; a rule in arithmetic; the practice of merchants purchasing foreign bills of exchange in order to enable them to make remittances to foreign countries without actually forwarding cash—the **COURSE OF EXCHANGE** is the value or price of such remittances, varying according

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to the demand for the time being. EXCHAN'GING, imp. EXCHANGED', pp. -chānjd'. EXCHAN'GER, n. one who deals in money in the way of giving the money of one country for that of another. EXCHANGE'ABLE, a. -ā bī, fit or proper to be exchanged; that may be exchanged. EXCHANGE'ABILITY, n. -bīl'i-tī, the state or quality of being exchangeable. BILL OF EXCHANGE, a written order or promise to pay money for value received—issued in the country where payable it is called an *inland bill*, if payable in another country it is called a *foreign bill* (see below).—SYN. of 'exchange, v.': to traffic; truck; commute; bargain; interchange; deal; trade.

EXCHANGE': building or place of resort for merchants. The name Bourse (Purse) is applied in France and Belgium to a resort of this kind; and in Berlin, Hamburg, and other German cities, there is the equivalent word Börse. Exchanges have usually comprehended an open quadrangle, surrounded by an arcade free to all persons; but in some cases large reading-rooms or halls now constitute resorts of this kind, and these are open only to a body of subscribers, and visitors whom they introduce.

Exchanges originated in the commercial cities of Italy, Germany, and the Netherlands, from which last-named country they were copied by England. The merit of introducing them is due to Sir Thomas Gresham, who, having resided as British agent at Antwerp 1550, chose the Bourse of that city as a model for the Royal Exchange of London. Their institution in England is therefore coincident with the rise of commercial prosperity in the middle of the 16th c. The first stone of Gresham's Bourse, for so it was originally called, was laid 1566, June 6, a site being found for it by removing eighty houses in Cornhill, and it was finished 1567, Nov. It consisted of a quadrangle with an arcade; above was a corridor with stalls, for the sale of wares. This corridor was called the *pawn*—believed to be a corruption of *bahn*—Ger. for path or walk. Outside were shops. The Bourse was ceremoniously opened by Queen Elizabeth immediately after dining at the house of Sir Thomas Gresham in Bishopsgate Street, 1570 (-71), Jan. 23. Having viewed the whole Bourse, the queen, by herald and trumpet, caused it to be proclaimed 'The Royal Exchange.' This first Exchange of London was almost entirely destroyed by the great fire of 1666. A new Exchange, forthwith erected on the spot, was opened 1669; this also was destroyed by fire, 1838. The foundation-stone of the third Exchange was laid by Prince Albert, 1842; and it was opened 1845, by Queen Victoria.

The term Exchange seems to have been naturally adopted from the circumstance that buying and exchanging of merchandise, and also exchanging and paying away of money, formed the chief object of concourse. In the present day, early intelligence in matters affecting commerce and public finance forms a principal attraction of this kind of resort. Although open daily, there are usually certain days and hours of meeting when the throng is considerable. The meeting is familiarly called 'Change.' The two great days of

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meeting at the Royal Exchange, London, are Tuesdays and Fridays, and the busiest time is from 3 to 4 o'clock. In London there are several other Exchanges, for special purposes; among these are the Corn Exchange in Mark Lane, the Coal Exchange in Lower Thames Street, the Hop and Malt Exchange in Southwark, the Hide and Skin Exchange or Market in Bermondsey, and the Stock Exchange near the Bank of England. Exeter Change, which was a sort of bazaar, with a menagerie of wild beasts, stood in the Strand, upon or near the site of the house of the Earl of Exeter; the building, as an interruption to the thoroughfare, was removed 1829. Numerous additions have recently been made to the list of exchanges in the large towns of England and Scotland. The Bourse at Paris, and the Produce Exchange at New York, are noteworthy for architectural elegance. In the United States, Exchanges are now found in all the large cities.

EXCHANGE, in Political Economy: sometimes the conversion of the money of one country into its equivalent in the money of another—as by stating the relation which French francs or British pounds bear to U. S. dollars. The technical meaning of the word has now, however, come to be the difference between the actual value of money, taken by the standard of bullion, in any two places with relation to each other. If, in New York, it costs more than \$100 to pay \$100 in St. Petersburg, the rate of exchange is against New York, and in favor of St. Petersburg, an inhabitant of which will be able to pay a debt of \$100 in New York with less than \$100 worth of bullion in St. Petersburg. The process will be best explained by analyzing it through means of simple examples. If Thomson & Co. of New York buy \$100 worth of paper from De la Rue of Paris, and De la Rue, on the other hand, buy \$100 worth of cotton goods from Thomson & Co. of New York, the two debts, *were there no others between the merchants of the same towns*, would extinguish each other, and there would be no necessity either for transmitting money or drawing bills of exchange. Suppose, however, that it is not De la Rue, but his neighbor Bonchamp who has bought the \$100 worth of cotton goods from Thomson & Co., then the debts of all will be settled by Bonchamp paying \$100 to De la Rue on Thomson & Co.'s account. Suppose, next, the case of De la Rue owing nothing to Thomson & Co., and Bonchamp owing them only \$50, a like sum has to be otherwise found. Van Pradt of Amsterdam is owing precisely this sum to Thomson & Co., while either De la Rue or Bonchamp is owing the same amount to Van Pradt for a purchase of Gouda cheeses; then it is clear that the several debts can be adjusted among them without the transmission of bullion. It will cost some trouble to adjust the payments, however, and this trouble will have to be paid for. As in paying Thomson & Co. their debt of \$100, De la Rue will have to pay for this trouble, the rate of exchange will be against him. If the debt, or any part of it, cannot be met by such an adjustment out of cross debts and credits, it will be necessary for the debtor to send bullion to his creditor; and this being an expensive process, it throws

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the rate of exchange against the debtor who so pays. For instance, if the sum due by the Frenchmen to Van Pradt was only \$25 instead of \$50, then De la Rue would have had to be at the expense of sending \$25 to New York in bullion. No such actual transactions take place in the mercantile world, because the accounts in debtor and creditor connected with the three towns above referred to are to be counted in thousands, and ramify into other towns; but the above examples may represent the groups of debtors and creditors, as algebraic signs represent quantities. The individual merchants in one trading town have no idea how the surplus of debit or credit may lie between them, far less can they tell how it may be adjusted by debits and credits in other towns; but through the agency of bankers, bill-discounters, and other persons who deal in money, the relations of all trading-places toward each other are in a constant state of shifting and adjustment; and any one who has to pay a debt in any trading-place can find out how much he has to give to get that payment made, and can pay it accordingly. When, through the operation of these complicated transactions, you require to give more than \$100 in New York to get that amount paid in Paris, then the rate of exchange is against New York, and is in favor of Paris, where less than \$100 in cash will pay a debt of \$100 in New York. The difference will generally depend on the difficulty of adjusting questions of debt and credit throughout the field of commerce, in such a manner as to procure payment of the debt. If it cannot be paid by adjustment, then bullion must be sent; and thus it is generally said, that the rate of exchange against any place is limited by the charge of transmitting bullion to it. The rate of exchange is liable to be brought to a level also by commercial exportation and importation, since, whenever it is expensive to get money sent to a country, there is a temptation to send goods to that country, to compensate the debt. In the general circle of transactions of this kind, the country or town which has the largest amount of transactions will have the largest number of debtors and of creditors, and will thus afford the chief facility for each compensating the other. It is thus that London is the centre of the money-market, where all the debts and credits in the world may be said to meet and extinguish each other. Formerly, extreme notions about the Balance of Trade (q.v.) led to the theory that any nation which the exchange was against was going to ruin; while that which the balance was in favor of was prospering through the other's loss. At present it is inconvenient and expensive to a country to have the exchange against it. An adverse exchange generally indicates a sort of break in the circle of trade, which it would be advantageous to fill up, and *may* be caused by the commerce of a country decreasing; on the other hand, however, the imports for which a country pays in cash or in expensive bills, may be the same as a highly advantageous traffic. Gold-producing countries find bullion their most advantageous export, as do countries into which gold has flowed in excess. See BILL OF EXCHANGE.

EXCHANGE, DEED OF: under the English common

EXCHANGES—EXCHEQUER.

law, a mode of conveying equal interests in lands, the one in consideration of the other. In the United States, the common-law deed of exchange has become obsolete, and lands may be exchanged by the ordinary deed of bargain and sale. The words 'excambium' and 'excambion' (see EXCAMP) were synonymous with exchange, in the technical sense above referred to.

EXCHANGES, MILITARY: certain arrangements made between officers of the English army. An officer may exchange, or change places, in the Guards, or Line, with another of equal rank in any regiment of the above corps, by mutual consent, and subject to the approval of the minister of war, and on payment of a sum agreed upon between the officers.

EXCHEAT, v. *ěks-chēt'* [*ex, cheat*]: in *OE.*, same as *escheat*: N. in *OE.*, a fraudulent exchange.

EXCHEQUER, n. *ěks-chēk'ēr* [F. *échiquier*; OF. *eschequier*, a chessboard, checker-work—said to have been so called from the large-patterned checked cloth which covered the table of the Exchequer]: a treasury; in *familiar language*, cash or funds in hand; in *Britain*, a court of law having exclusive jurisdiction in all cases affecting the public revenue; one of the divisions of the high court of justice: V. to institute proceedings in the court of exchequer. EXCHEQUERING, imp. EXCHEQUERED, pp. *-ērd*. EXCHEQUER TALLIES, rude device in use till 1783 in the English Exchequer, for checking accounts. They were seasoned wands of ash, hazel, etc., duly inscribed and notched, then split, and one-half given to the payer. When he presented his half, if it were found to match the half retained, the proper payment was made to him.

EXCHEQUER, CHANCELLOR OF THE: in Britain, in modern times, the first finance minister of the crown. Strictly speaking, he is the under-treasurer, the office of lord high treasurer being now vested in the lords commissioners of the treasury. When the prime minister is a member of the house of commons, he sometimes holds the office of chancellor of the exchequer. The judicial functions of the chancellor of the exchequer may now (since 1735) be considered matter only of history. See EXCHEQUER, COURT OF.

EXCHEQUER, COURT OF: now merged in the high court of justice in England: formerly the court wherein all matters relating to the royal revenues were adjudicated. It is said (Madox, *Hist. of Ex.* i. 177) that as early as the reign of William the Conqueror a court of exchequer was in existence. This was probably nothing more than a branch of the *Aula Regia*, or great council of the nation; but on the subdivision of that court in the reign of Edward I., the court of exchequer acquired a separate and independent position. The special duty then assigned to the court was to order the revenues of the crown, and recover the king's debts and duties. The court was then denominated the *Scaccarium* (from *scaccus* or *scaccum*, a chess-board), because a checkered cloth was anciently wont to be

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laid upon the table of the court (Madox, *Hist. of Ex.*). The court formerly consisted of two divisions, an equity, and a common law or plea side. Lord Coke (*Inst.* iv. 118) appears to doubt whether the equitable jurisdiction of the court can be traced back further than the statute 38 Henry VIII. c. 39. This equitable jurisdiction of the exchequer was abolished by 5 Vict. c. 5, and transferred to the court of chancery. On the first institution of the court of exchequer the business was confined chiefly to matters connected with the royal revenue, but a privilege was conceded to all the king's debtors and farmers, and all accountants of the exchequer, to sue and implead all manner of persons. Gradually the court of exchequer acquired a concurrent jurisdiction with the other courts of common law. The judges of the exchequer consisted originally of the lord treasurer, the chancellor of the exchequer, and three puisné judges, called barons of the exchequer. From 1873 to 81 the court constituted a division of the high court of justice, having a chief baron and four barons of exchequer. But by the Supreme Court of Judicature Act (1881), the power formerly exercised by the chief baron of exchequer, was transferred to the lord chief-justice of England.

The Court of *Exchequer Chamber*, established by 31 Edw. I. c. 12, was formerly a court of all the judges in England assembled for decision of matters of law (Coke, *Inst.* iv. 110, 119). Its ordinary jurisdiction was as a court of error, in which capacity it revised the judgments of the three courts of common law. Since 1873, appeal lies from each division of the high court of justice in England, direct to the court of appeal, which succeeded to the jurisdiction formerly vested in the house of lords, as the supreme court of appeal, and consists of the lord chancellor, and the chiefs of the divisions, and the judges of the privy council.

In Scotland, before the Union, the exchequer was the king's revenue court. By 19 and 20 Vict. c. 56, the court of exchequer is abolished, and the jurisdiction transferred entirely to the court of session.

The Court of *Exchequer Chamber* in Ireland, established by 40 Geo. III. c. 39, was abolished as an intermediate court of appeal between the Irish courts and the high court in England.

EXCHEQUER BILLS, in England: bills issued at the Exchequer under the authority of acts of parliament, as security for money advanced to the government. They contain an engagement on the part of the government for the payment of the principal sums advanced with interest. These bills form the chief part of the unfunded debt of the country. They were issued first in the reign of William III., 1696, and were drawn for various amounts from £100 to £5. At that time they bore interest at the rate of three-pence per day on a hundred pounds (Macaulay, *History of England*, iv. 700) the interest was reduced to 2*d.* during the reign of Anne. During the war 1793-1814, the rate of interest was usually 3½*d.* At present. it is generally from 1½*d.*

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to 2½*d.* per £100 per diem. Holders of these bills are exempt from all risk, except that arising from the amount of premium or discount they may have given for them. The bills, varying in amount from £100 to £1,000, pass from hand to hand as money, and are payable at the Treasury at par. They may be paid also to government in discharge for taxes. When it is intended to pay off outstanding Exchequer bills, public notice is given by advertisement. The advances of money to the government by the Bank of England are made on Exchequer bills. These bills are a convenient means whereby the government can meet a sudden demand for unusual expenditure. The amount of Exchequer bills in 1880-1 was £5,162,800. Another portion of the unfunded debt is constituted by Exchequer Bonds, with fixed rates of interest for definite periods. In 1881 their value was £11,483,700. Between 1874 and 81 the total unfunded debt (including Treasury Bills, Exchequer Bills, and Exchequer Bonds) rose from £4,479,600 to £22,077,500.

EXCIPIENT [Lat. *excipio*, I receive]: inert or slightly active substance, introduced into a medical prescription as a *vehicle*, or medium of administration for the strictly medicinal ingredients. Thus, conserve of red roses, or bread-crumbs, is used to make up pills; sulphate of potash, or white sugar, in medicinal powders; water, mucilage, white of egg, and many other substances in fluid mixtures.

EXCIPULUS, n. *ĕk-sĭp'ū-lŭs*, or **EXCIP'ULA**, and **EXCIPIE**, n. *ĕk-sĭp'ĭ* [L. *excipŭlă*, receivers, receptacles—from *excipĭo*, I catch, alluding to the roughness of the surface]: in *bot.*, a receptacle containing fructification in lichens; a minute species of black fungus found in autumn upon dead raspberry-stems.

EXCISE.

EXCISE, n. *ĕk-sîz'* [L. *excisus*, cut out or off—from *ex*, out off; *cædo*, I cut: F. *excise*, tax on merchandise—*lit.*, a piece or part cut out or off]: a tax or duty levied on articles produced and consumed in a country, as on spirits, malt, etc.; a tax levied on licenses to pursue certain trades, and deal in certain commodities: **ADJ.** pertaining to the duties levied on certain articles produced and consumed at home: **V.** to levy a tax on. **EXCISING**, imp. **EXCISED'**, pp. *-sîzd'*. **EXCIS'ABLE**, a. *-sîz'ă-bl*, liable to be taxed. **EXCISE'MAN**, n., or **EXCISE-OFFICER**, n. one who inspects and rates articles liable to excise duty. *Note.*—In the sense of 'a duty or tax on native commodities, etc.,' *excise* is clearly a corruption and an accommodation in popular etymology of sound to sense: the OF. *assise* was the assize or sessions at which commodities were assessed, and finally the taxes so imposed. From a similar source the Belgium *accûse* is tribute: comp. Sp. *sisa*, assize, excise; old Dut. *aksûs*; Ger. *accise*, excise: see **ASSIZE**.—*Excise* is not, according to its name, a part of the value of a commodity taken out and given to the public revenue; for the manufacturer who looks to a profit on his outlay merely counts the tax as part of his expenditure, which he intends to get back with a profit, so that it constitutes an addition to the ultimate price which the purchaser or consumer has to pay. A tax on commodities sold and bought is a very obvious one, but it has generally appeared in the simple shape of a toll on goods brought to market; and the complicated arrangements for officially watching the process of a manufacture for the purpose of seeing that none of the dues of the revenue are evaded, is of comparatively modern origin. It was introduced into England by the Long Parliament, who established an excise on liquors 1643. Though always unpopular, the excise in some form or other has ever since continued as a material element in the taxation and revenue of Britain. In the earlier part of last century Sir Robert Walpole entertained the notion of enlarging its productiveness while mitigating its proportional pressure, by the bonding system, which suspends the exaction of the duty until the goods are sold, and thus leaves the manufacturer all his capital to be devoted to production: see **WAREHOUSING SYSTEM**. But the rumor of an enlargement of the unpopular excise duty created a general excitement, and the memorable cry of 'Liberty, Property, and no Excise,' compelled Walpole to abandon his project.

An excise, compared with other taxes, has its good and its bad features: it is a method of extracting money for national purposes from personal expenditure on luxuries, and is especially serviceable when fed from those luxuries the use of which in excess becomes a vice. On the other hand, it renders necessary a system of inquisitorial inspection not only very offensive to all free people, but very open to abuse and fraud; while at the same time excessively high duties, and duties on commodities strictly of domestic manufacture, lead to smuggling and all its demoralizing consequences. The evils of an excise were formerly aggravated by the practice of farming the duties—that is, by letting them to the highest bidder, whose interest it became,

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like any other contractor, to make the greatest possible profit by his speculation, and consequently to exact the duties in the most rigorous manner. In every well-regulated revenue system, it is of course only fair to all parties that the duty as the law lays it on should be fully exacted; but in the age of farming, the arrangements were all slovenly, and there was much latitude of power in the hands of the farmers. The farming system became very oppressive in France, especially in the *gabelle* or excise on that necessary of life, salt. It is a curious fact, however, that when the farming of the excise was abolished in Scotland by the Union, the people grumbled, saying they were easier under the farmers, their own neighbors, who acted on the principle of 'live and let live,' than under the officers sent from England, who rigidly collected the impost.

An excise works most easily when it is laid on some commodity not of domestic production, but created by manufacturers on a large scale. In a great distillery, the excise officer is almost a portion of the establishment, who has an eye on every step of the process, with the view of seeing that the commodity does not go into the market without government obtaining its proper share—sometimes far the greater part—of the market price. The social influence of such an arrangement is very different from that of the old candle and salt duties, which made it the function of the exciseman to pounce on a farmer's family melting the surplus tallow of the last killed sheep, or of a fisherman boiling sea-water to procure salt for his potatoes. The manufacturer, however, though he has the benefit of the bonding system, feels the excise regulations as a perpetual drag and hinderance in his operations, since there are multitudes of minute operations which he cannot perform without sending special notice to the excise department, or having an officer actually present. This renders it necessary, too, that all the steps of the process should not merely be defined as between the manufacturer and the officer, but should be set forth in an act of parliament; and hence deviations for the purpose of economy, or by way of experiment, become difficult, and sometimes impracticable. As difficulties with which the producer has to contend, these things require him to lay on the selling price of the commodity a larger addition, by reason of the excise, than the actual amount of the duty.

No method of taxation requires a nicer adjustment to the social condition of a country than an excise. Thus, in England, in 1746, a duty of 20s. a gallon was laid on spirits, with the view of suppressing the vice of drunkenness, which, on the other hand, it greatly increased, for the law became a dead letter, and the smuggler fully supplied the market, though within the two years in which the law was in force, no fewer than 12,000 persons were, according to Tindal's History, convicted of offenses against the act. In Scotland, the duty, which was 5s. 6d. a gallon, had to be reduced in 1823 to 2s., on account of the prevalence of smuggling—half the consumption of the country, in fact, paying no duty. The duty has since then been gradually

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raised, until it now amounts to 10s. a gallon, forming a vast source of revenue. The whole excise revenue of the United Kingdom for 1895-6 amounted to £26,800,000, of which £16,380,134 were derived from spirits, £11,130,854 from beer, and £1,574,570 from the licenses of publicans or retail liquor-dealers of all kinds. The productiveness of this great source of revenue, and the expense connected with the levying of a duty on other commodities, has led to the gradual removal of many excise duties, as, for instance, on salt, candles, leather, glass, soap, paper, and race-horses. The malt-tax was transferred to beer 1880. In 1849, the excise department was amalgamated with that of stamps and taxes to form the Board of Inland Revenue; and many changes have been made both as to the articles taxable, and on the organization of the excise system. The only articles on which excise duties are now charged are spirits, beer, chicory, and the passenger receipts of railway companies. But various taxes of the nature of license-duties for following particular pursuits are collected in the excise department; also several items chargeable before 1869 as assessed taxes. License-duties must be taken out yearly by auctioneers, appraisers, brewers, maltsters, distillers, makers of vinegar, victuallers, sellers of beer, spirits, and wine, sellers of playing cards if also makers, hawkers, horse-dealers, house-agents, tobacconists, pawnbrokers, dealers in sweets, and dealers in patent medicines. Game-licenses, gun-licenses, and licenses for male-servants, horses, dogs, carriages, and the use of armorial bearings, come under the same department. According to the present organization of the excise department, the United Kingdom is divided into collections, each under a collector; the collections are subdivided into districts, each under a supervisor; and these into divisions, each under divisions-officers and ride-officers. The efficiency with which these officials discharge their duties secures a very complete payment of taxes, and their manner of dealing with the tax-payers leaves a *minimum* of just ground for complaint.

In the United States, the word excise is little used except in reference to a tax on the sale of intoxicating liquor.—See INTERNAL REVENUE: TAX.

EXCISION, n. *ĕk-síz'h'ŭn* [F. *excision*—from L. *excisio-nem*, destruction: L. *excisus*, cut out or off (see EXCISE)]: a cutting out or off; amputation; destruction.

EXCITE, v. *ĕk-sít'* [F. *exciter*—from L. *excitāre*, to rouse up—from *ex*, out of; *cito*, I call or summon: It. *eccitare*]: to call into action; to rouse; to animate; to stimulate; to inflame; to raise or stir up. EXCITING, imp.: ADJ. calling or rousing into action; stimulating. EXCITED, pp.: ADJ. roused; awakened; animated. EXCITER, n. one who. EXCITABLE, a. *-sī-tā-bl* [F.—L.]: easily provoked or called into action. EXCITABILITY, n. *-bīl'i-tī*, the being easily provoked or called into action. EXCITEMENT, n. *-sīt'měnt*, state of being excited; agitation; that which excites. EXCITANT, a. *-sī-tānt* [F.—L.]: that which produces or is

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capable of producing increased action; in *med.*, excitants are stimulants, pharmaceutical preparations which, acting through the nervous system, tend to increase the action of the heart and other organs. They all have more or less pungent and acrid taste, and give rise to a sensation of warmth when placed on a tender part of the skin. The class is very numerous; and the application should be under the supervision of a qualified medical practitioner. **EXCITATIVE**, a. *-sì-tā-tiv*, having power to excite. **EXCITATION** n. *-sì-tā-shün* [F.—L.]: the act of exciting. **EXCITATORY** a. *-tér-ì*, tending to excite. **EXCITINGLY**, ad. *-lì*. **EXCITOMOTOR ACTION**: see **NERVOUS SYSTEM**. **EXCITING-CAUSES** n. in *med.*, causes which tend immediately to produce disease, as distinguished from predisposing causes, which during long periods of time prepare the way for it to arise. **EXCITO-MOTORY**, a. in *anat.*, the function of the nervous system by which an impression is transmitted to a centre and reflected so as to produce contraction of a muscle without sensation or volition.—**SYN.** of 'excite': to incite; awaken; arouse; irritate; provoke; kindle; stir up; agitate

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EXCLAIM, v. *ěks-klām'* [OF. *exclamer'*—from L. *ex clamārē*, to cry aloud—from *ex*, out of; *clāmō*, I cry: It. *esclamare*]: to cry out loudly; to speak or utter emphatically; to make a loud outcry in words: N. in *OE.*, clamor; outcry. **EXCLAIM'ING**, imp. **EXCLAIMED'**, pp. *-klāmd'*. **EXCLAIM'ER**, n. one who. **EX'CLAMA'TION**, n. *-klā-mā shūn* [F.—L.]: outcry; a loud noise in words; vehement utterance; the point or mark (!) put after the words expressing emphatic speech. **EXCLAM'ATIVE**, a. *-klām'ā-tīv*, containing exclamation. **EXCLAM'ATORY**, a. *-tēr-ī*, expressing exclamation.—**SYN.** of 'exclamation': clamor; cry; uproar; acclamation; tumult; bawling; shouting; vociferation; utterance.

EXCLAVE, n. *ěks'klāv* [L. *ex*, out; *clavis*, key]: portion of a country separated from the main part.

EXCLUDE, v. *ěks-klōd'* [L. *excludēre*, to shut out, to exclude—from *ex*, out of; *claudō*, I shut: It. *escludere*: F. *exclure*]: to hinder from entering; to shut out; to debar; to prohibit; to except. **EXCLU'DING**, imp. **EXCLU'DED**, pp. **EXCLU'SION**, n. *-klō'zhūn* [F. *exclusion*—from L. *exclūsionēm*—from *clausus*, closed, shut]: the act of shutting out; the act of debarring; rejection; exception. **EXCLU'SIONARY**, a. *-ēr-ī*, tending to exclude or debar. **EXCLU'SIONIST**, n. one who would debar another from any right or privilege. **EXCLU'SIVE**, a. *-klō'siv*, tending to exclude; having the power to exclude; not admitting to social intercourse; illiberal; not taking into the account; not including. **AN EXCLUSIVE**, one whose real or affected fastidiousness makes his circle of acquaintance more than ordinarily select. **EXCLU'SIVELY**, ad. *-lī*. **EXCLU'SIVENESS**, n.—**SYN.** of 'exclude': to forbid; deprive; hinder; disqualify; preclude; thrust out; eject.

EXCLUSION BILL: proposed measure for excluding the Duke of York, afterward James II., from the succession to the English throne, on account of his avowed Rom. Catholicism. A bill to this effect passed the commons 1679, but was thrown out by the upper house. As the new parliament summoned 1681 seemed determined to revert to this measure, it was dissolved, and Charles ruled henceforth without control. See **CHARLES II.**

EXCOGITATE, v. *ěks-kōj'ī-tūt* [L. *excōgitātus*, found out by thinking, devised—from *ex*, out of; *cōgitō*, I think]: to invent or contrive; to strike out by thinking. **EXCOG'ITATING**, imp. **EXCOG'ITATED**, pp. **EXCOG'ITA'TION**, n. *-tā'shūn*, invention or contrivance by thinking.

EXCOMMUNICATE, v. *ěks'kōm-mā'nī-kāt* [L. *excommunicātus*, put out of a community—from *ex*, out of; *communīcātus*, having anything in common with one: It. *communicare*; F. *communiquer*, to impart]: to expel or exclude from the communion of the church; to deprive of church privileges: N. one who is excluded from the fellowship of the church: **ADJ.** excluded from church privileges. **EX'COMMUNICATING**, imp. **EX'COMMUNICATED**, pp. : **ADJ.** expelled or separated from communion with a church. **EX'COMMUNICA'TION**, n. *-kā'shūn* [F.—L.]: act of expelling from the communion of a church; deprivation of church

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privileges; withdrawal of Christian fellowship by a church. The ancient Romans had something analogous in the exclusion of persons from the temples and from participation of the sacrifices, which persons were also given over with awful ceremonies to the Furies. The Mosaic Law decreed excommunication in case of certain offenses; and the intimate connection of things civil and ecclesiastical under the Jewish polity, rendered it terrible even as a temporal punishment. The Jews, in practice, had three degrees of excommunication. The first, *Niddui*, was an exclusion from the synagogue for 30 days, that the offender might be ashamed. The second, *Cherem*, also was for 30 days, but beside exclusion from the synagogue, carried with it a prohibition to all other Jews of any intercourse with the individual, and was often proclaimed with sound of trumpet. The third, *Shammatha* or *Anathema Maranatha* (see I. Cor. xvi. 22), was exclusion from the synagogue and privileges of the Jewish Church for life, with loss of civil rights, and was accompanied with terrible curses, in which the offender was given over to the judgment of God. In the Christian Church, excommunication has in all ages been practiced, as indeed every society must necessarily have the power of excluding unworthy members and those who refuse to comply with its rules, and the New Testament plainly recognises and establishes this right in the church. But two different degrees of excommunication were soon distinguished—the first or lesser, a mere exclusion from the Lord's Table and from other privileges of members of the church; the second or greater, pronounced on obstinate offenders and persons who departed into deadly errors of doctrine, more solemn and awful, and not so easily capable of being revoked. Penances and public professions of repentance were required; and in Africa and Spain, the absolution of *lapsed* persons (i. e., those who in time of persecution had yielded to the force of temptation, and fallen away from their Christian profession by the crime of actual sacrifice to idols) was forbidden, except at the hour of death, or in cases where martyrs interceded for them. But for a long time, no civil consequences were connected with excommunication. Afterward, the greater excommunication was accompanied with loss of political rights, and exclusion from public offices. The power of excommunication also, which had been at first in the church as a body, gradually passed into the hands of the bishops, and especially of the popes, who did not scruple to exercise it against entire communities at once. The *capitularies* of Pepin the Less, in the 8th c., ordained that the greater excommunication should be followed by banishment from the country. The Roman Cath. Church pronounces the sentence of excommunication with many circumstances of terrible solemnity, and it contains a prohibition to all Christian persons of all intercourse with the person excommunicated, and of extending to him even the most ordinary social offices. The latest 'examples' made by the pope were Napoleon I. 1809, and Victor Emmanuel, King of Italy, 1860, neither of whom, however, was excommunicated by name,

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the pope having confined himself to a solemn and reiterated publication of the penalties decreed by his predecessors against those who unjustly invaded the territories of the Holy See, usurped or violated its rights, or violently impeded their free exercise. Pope Innocent III., in the Lateran Council (1215), declared that excommunication put an end to all civil rights and dignities, and to the possession of any property. The excommunication of a sovereign was regarded as freeing subjects from their allegiance, and in 1102, this sentence was pronounced against Emperor Henry IV., an example which subsequent popes ventured to follow. But the fearful weapons with which the popes armed themselves in this power of excommunication, were rendered much less effective through their incautious employment, the evident worldly motives by which it was sometimes governed, and the excommunications which rival popes hurled against each other during the time of the great papal schism. The Greek Church also makes use of excommunication, and every year at Constantinople, on a certain Sunday, the greater ban is pronounced against the Rom. Cath. Church.—The Reformers retained only that power of excommunication which appeared to them inherent in the constitution of the Christian society, and to be sanctioned by the New Testament; nor have any civil consequences been generally connected with it in Prot. countries. To connect such consequences with excommunication in any measure whatever, is certainly inconsistent with the principles of the Reformation. Nevertheless, in England, until the 53d of Geo. III. c. 127, and in Ireland, until the 54th, c. 68, persons excommunicated were debarred from bringing or maintaining actions, from serving as jurymen, from appearing as witnesses in any cause, and from practicing as attorneys in any of the courts of the realm. All these disabilities were removed by the statutes above named; and the excommunicated were declared no longer liable to any penalty, except 'such imprisonment, not exceeding six months, as the court pronouncing or declaring such person excommunicate shall direct.

In the Rom. Cath. Church, the power of excommunicating is held to reside, not in the congregation, but in the bishop; and this is believed to be in exact accordance with the remarkable proceeding commemorated I Cor. v. 3-5, and with all the earliest recorded examples of its exercise. Like all the other powers of the episcopate, it is held to belong, in an especial and eminent degree, to the Roman bishop, as primate of the church; but it is not thought to belong to him exclusively, nor has such exclusive right ever been claimed by the bishops of Rome. On the contrary, bishops within their sees, archbishops while exercising visitatorial jurisdiction, heads of religious orders within their own communities, all possess the power to issue excommunication, not only by the ancient law of the church, but also by the most modern discipline. As to the prohibition of intercourse with the excommunicated, a wide distinction is made between those who are called

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'tolerated' and those who are 'not tolerated.' Only in the case of the latter (a case extremely rare, and confined to heresiarchs, and other signal offenders against the faith or public order of the church) is the ancient and scriptural prohibition of intercourse enforced. With the 'tolerated,' since the celebrated decree of Pope Martin V. in the Council of Constance, the faithful are permitted to maintain the ordinary intercourse. It is a mistake, likewise, to ascribe to Rom. Catholics the doctrine, 'that excommunication may be pronounced against the dead.' The contrary is expressly laid down by all canonists (Liguori, *Theologia Moralis*, lib. vii. n. 13, 1). In the cases in which this is said to have been done, the supposed 'excommunication of the dead' was merely a declaration that the deceased individual had, *while living*, been guilty of some crime to which *excommunication is attached by the church laws*. Rom. Cath. writers, moreover, explain that the civil effects of excommunication in the mediæval period—such as incapacity to exercise political rights, and even forfeiture of the allegiance of subjects—were annexed thereto by the civil law itself, or at least by a common international understanding in that age. Examples are alleged in the law of Spain, as laid down in the Sixth Council of Toledo—a mixed civil and ecclesiastical congress—(638); in the law of France, as admitted by Charles le Chauve (859); in the Saxon and in the Swabian codes; and even in the English laws of Edward the Confessor; all which, and many similar laws, proceed on the great general principle of these mediæval monarchies, viz., that orthodoxy and communion with the Holy See were a necessary condition of the tenure of supreme civil power; just as by the 1 Will. and Mary, s. 2, c. 2, profession of Protestantism is made the condition of succession to the throne of England. Hence, it is argued, the mediæval popes, in excommunicating sovereigns, and declaring their subjects released from allegiance, did but declare what was, by the public law of the period, the *civil* effect of the exercise of what in them was a *spiritual* authority. By the discipline of the Rom. Cath. Church, kings or queens, and their children, are not included in any general sentence of excommunication, unless they be specially named.

The lowest and simplest form of excommunication—the only form recognized by some opponents of ecclesiasticism—is merely a withdrawal of Christian fellowship, pronounced by a church acting not as a court but as a brotherhood. It is intended not as a *penalty*, but as a protection to the church, and as a warning to the offender with a view to his reclamation.

EXCORIATE, v. *ěks-kō'rĭ-āt* [L. *excōriātus*, having stripped off skin—from *ex*, out of; *cōriūm*; Gr. *choriōn*, skin, hide: F. *excorier*]: to wear or strip off the skin; to break the skin by rubbing; to gall or abrade. EXCO'RIATING, imp. EXCO'RIATED, pp. EXCO'RIATION, n. *-ā-shūn* [F.—L.]: the act of wearing or rubbing off the skin; an abrasion.

EXCORTICATION—EXCULPATE.

EXCORTICATION, n. *ěks-kōr'ti-kā'shūn* [F. *excortication*—from L. *ex*, out of; *cortex* or *corticem*, bark]: the act of stripping off bark. **EXCORTICATED**, a. stripped of the bark.

EXCREMENT, n. *ěks'krě-měnt* [F. *excrément*—from L. *excrēmētum*, that which passes from the body—from *ex*, out of; *crētus*, separated: It. *escremento*]: matter discharged from an animal body after digestion; dung; filth. **EXCREMENTAL**, a. *-tāl*, discharged or voided as excrements. **EXCREMENTITIOUS**, a. *-měn-tish'ūs*, pertaining to or consisting of matter voided from the animal body.

EXCRESCENCE, n. *ěks-krě'sěns* [OF. *excrecence*, an excrecence: L. *excrēscēntiā*, morbid excrecences on the body—from *ex*, out of; *crescens* or *crescēntem*, growing: It. *escrecenza*: F. *excroissance*]: a protuberance or growth on any body; an outgrowth; a superfluity. **EXCRESCENT**, a. *-ěnt*, growing out of, as a superfluity. **EXCRESCENT CONSONANTS**, term introduced by Prof. Key to designate what before was called Epenthesis.

EXCRETE, v. *ěks-krět* [L. *excrētus*, sifted out, separated (see **EXCREMENT**)]: to separate and throw off; to discharge from the body; to strain out. **EXCRETING**, imp. **EXCRETED**, pp. **EXCRETION**, n. *-krě'shūn* [F.—L.]: a throwing off or voiding matter from an animal body; any matter excreted; a discharge from the bowels (see **SECRETION**). **EXCRETA**, n. plu. *ěks-krě tā*, the dung of animals. **EXCRETIN**, n. *ěks'krě tīn*, a crystalline slightly alkaline substance said to be found in fresh nightsoil or excreta. **EXCRETIVE**, a. *-tīv*, having power to eject certain matter from the body. **EXCRETORY**, a. *-těr-ī*, having the power to excrete: N. a duct or vessel which conveys secreted fluid from a gland. **EXCRETOLIC**, a. *ěks-krě'tō-līk*, denoting an acid said to be obtained from fresh nightsoil. **EXCRETORY ORGANS**, n. in *anat.*, the organs by which excretion takes place; specifically, the skin, the lungs, and the kidneys.

EXCRIPT, n. *ěks'krīpt* [L. *exscriptus*, pp. of *exscribo*, I write out]: in *law*, a copy, a writing copied from another.

EXCRUCIATE, v. *ěks-krō'shī-āt* [L. *excruciātus*, tortured greatly—from *ex*, out of, very much; *cruciātus*, tortured—from *crux*, a cross]: to torment; to torture; to inflict severe pain on. **EXCRUCIATING**, imp.: **ADJ.** extremely painful; agonizing. **EXCRUCIATED**, pp. **EXCRUCIATION**, n. *-ā'shūn*, extreme pain; torture.

EXCUBITORIUM, n. *ěks-kū-bŕ'tō'rĭ-ŭm* [L.—from *excubo*]: in *arch.*, a gallery or loft in a church where watch was kept at night on the eve of any great festival, and from which the great shrines were observed.

EXCUDIT, v. *ěks-kū'dīt* [L.—from *excudo*, I engrave]: he engraved it; word placed at the bottom of an engraving, preceded by the name of the engraver.

EXCULPATE, v. *ěks-kŭl'pāt* [L. *exculpātus*, cleared of blame—from *ex*, out of; *culpā*, blame: It. *colpare*, to blame, to censure]: to clear by an explanation from the charge of a fault or of guilt; to excuse; to clear from blame; to justify;

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to exonerate. **EXCULPATING**, imp. **EXCULPATED**, pp. **EXCULPATION**, n. -pā'shūn, the act of vindicating from the charge of a fault or crime; an excuse. **EXCULPATORY**, a. -pā'tēr-ī, clearing from the charge of a fault. **LETTERS OF EXCULPATION**, in the *law of Scotland*, warrants granted to the accused party in a criminal prosecution, to enable him to cite and compel the attendance of such witnesses as he may judge necessary for his defense.

EXCURRENT, n. ěks-kŭr'rěnt [L. *ex*, out of; *currentem*, running]: in *bot.*, running out beyond the edge or point; applied to the central stem of a tree with the branches surrounding it in regular order, as in a fir-tree.

EXCURSION, n. ěks-kěr'shŭn [F. *excursion*—from L. *excursiōnem*, a running out or forth—from *ex*, out of; *cursus*, a running: It. *escursione*]: a pleasure-trip; a short tour; a ramble; a digression; a wandering from the subject or main design. **EXCURSIONIST**, n. -shŭn-ist, one travelling to a place for pleasure. **EXCURSIVE**, a. -siv, rambling; wandering. **EXCURSIVELY**, ad. -lī. **EXCURSIVENESS**, n. the act of wandering. **EXCURSUS**, n. ěks-kěr's'ŭs [L. a running out or forth]: added notes containing additional information on certain points; a digression; a less formal dissertation.—**SYN.** of 'excursion': tour; jaunt; journey; expedition; trip.

EXCUSE, n. ěks-kŭs' [F. *excuse*, an excuse; *excuser*, to excuse—from L. *excusāre*, to free from blame—from *ex*, out of; *causa*, a cause, a suit: It. *excusare*]: that which excuses or justifies; a plea offered in extenuation of a fault; an apology: a pretext. **V.** ěks-kŭz', to pardon; to overlook on giving an explanation or apology; to disengage or free from an obligation; to justify. **EXCUSING**, imp. **EXCUSED**, pp. -kŭzd'. **EXCUSER**, n. -kŭ'zér, one who. **EXCUSABLE**, a. -zŭ-bl, pardonable; admitting of excuse. **EXCUSABLY**, ad. -blī. **EXCUSABLENESS**, n. -bl-něs, the state of being excusable. **EXCUSATORY**, a. -tēr-ī, containing an excuse or apology. **EXCUSELESS**, a. -kŭs'lěs, that for which no excuse or apology can be offered.—**SYN.** of 'excuse, n.': justification; exculpation; defense; plea; pretense; release; acquittal; absolution;—of 'excuse, v.': to acquit; free; release; exculpate; absolve; forgive; overlook; remit; relieve.

EXE, ěks: river of the s.w. of England, rising in Exmoor, in the w. of Somersetshire, flowing 19 m. s.e. to the borders of Devonshire, and then 35 m. s. through the e. part of that country into the English Channel at Exmouth. The lower five miles form a tideway a mile broad at high water, with wooded and picturesque shores, and navigable for large vessels. The chief tributaries are the Barle, 24 m. long, Batham, Loman, Culm, and Creedy. The E. passes Dulverton, Brompton, Exeter, and Topsham. It has a clear and merry current through wooded and romantic vales.

EXEAT, n. ěks'ě-ăt [L. *exěāt*, let him go out—from *ex*, out of; *ěō*, I go]: a bishop's permission to a priest to leave

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his diocese; permission to a student to leave his residence in his college.

EXECRATE, v. *ěks'ě-krāt* [L. *exsecrātus*, accursed—from *ex*, out of; *sacrō*, I devote or doom to destruction: It. *esecrare*: F. *exécrer*, to execrate]: to detest utterly; to abominate; to denounce evil against; to curse. **EX'ECRATING**, imp. **EX'ECRATED**, pp. cursed; denounced. **EX'ECRABLE**, a. *-krā-bl* [F.—L.]: very hateful; detestable. **EX'ECRABLY**, ad. *-blī*. **EX'ECRA'TION**, n. *-krā shūn* [F.—L.]: the expression of utter detestation; imprecation of evil.

EXECUTE, v. *ěks'ě-kūt* [F. *exécuter*—from L. *exsecūtūs*, followed to the end—from *ex*, out of; *secūtūs*, followed]. to carry into complete effect; to perform; to inflict; to put to death by form of law; to complete, as a legal document. **EX'ECUTING**, imp. **EX'ECUTED**, pp. **EX'ECUTANT**, n. *-tant*, one who performs; a performer, as an *executant* on the piano. **EXECUTER**, n. *ěks'ě-kū-tēr*, one who performs or does a thing; in *OE.*, one who inflicts the punishment of death; an executioner. **EX'ECU'TION**, n. *-kū shūn* [F.—L.]: performance; mode of performing or carrying into effect; a legal warrant or order; signing of a deed; capital punishment; destruction; effect produced: in the *law of Scotland*, attestation by a messenger-at-arms (q.v.), or other officer of the law, that he has given a citation, or carried through a diligence (q.v.), in terms of the warrant of the judge. It corresponds to an affidavit of service of writ or summons in the common-law courts, and of a bill or claim in chancery: see **EVIDENCE**. **EX'ECU'TIONER**, n. *-shūn-ēr*, he who puts to death by legal warrant; a hangman (see **CAPITAL PUNISHMENT**). **EXECUTION OF THE DEATH-SENTENCE** (see below). *Military and Naval Executions* are usually by either hanging or shooting: see **PUNISHMENTS, MILITARY AND NAVAL: MUTINY ACT**. **EXECUTIVE**, n. *ěgz-ěk'ū-tiv*, the person or body in the administration of a country who puts the laws in force—thus distinguished from the legislative and judicial bodies; the governing person or body (see **ADMINISTRATION, in Politics: EXECUTIVE DEPARTMENT: GOVERNMENT**): **ADJ.** pertaining to the governing body; having the power to put the laws in force; not legislative or judicial; active. **EXEC'UTIVELY**, ad. *-lī*. **EXEC'UTOR**, n. *-tēr*, a person appointed by a testator to carry out his will. **EXECUTRIX**, n. *-trīks*, a woman so appointed. **EXEC'UTORSHIP**, n. the office of an executor. **EXECUTRY**, n. *ěgz-ěk'ū trī*, in *Scotch law*, general name for all the movable estate and effects of a deceased person (except the heirship movables), being the proper subject of the executor's administration. **EXEC'UTO'RIAL**, a. *-tō'ri-āl*, pertaining to an executor. **EXECUTORY**, a. *-tēr-ī*, performing official duties; having authority to put the laws in force. **EXECUTABLE**, a. *ěgz-ěk'ū-tā-bl*, capable of being accomplished; feasible. **EXECUTOR DATIVE**, *ěgz-ěk'ū-tēr* [*dative*, given or assigned—from L. *datus*, given]: in *Scot.*, an officer or executor legally appointed to administer a deceased intestate's movable estate on behalf of all concerned. **EXECUTOR DE SON TORT**, in *law*, 'if a stranger takes upon him

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to act as *executor*, without any just authority, as by intermeddling with the goods of the deceased, and many other transactions, he is called in law an *executor* of his own wrong, *de son tort*, and is liable to all the trouble of an executorship; but merely locking up the goods, or burying the corpse of the deceased, will not amount to such an intermeddling as will charge a man as *executor* of his own wrong.'—*Blackstone*. EXECUTOR NOMINATE, the person who had been appointed by deceased.—SYN. of 'execute': to accomplish; effect; achieve; fulfil; consummate; finish.

EXECUTIONER: the official who executes the sentence of capital punishment. (It is common, and convenient, to speak of him as executing the criminal: strictly, it is the *sentence* or the penalty that he executes). In England, and in the United States, it is the province of the sheriff to perform this as well as every other ministerial duty enjoined by the criminal courts, but practically he acts by his servants or officers, and he only attends to see the law properly carried out. In royal burghs in Scotland, this duty is imposed on the civic magistracy, one of whom attends for the purpose. In times happily gone by, so numerous were the public executions in Britain, that almost every county and town had its executioner, as an acknowledged officer of justice, with a salary for his subsistence. Yet, we learn that on certain occasions, so odious and so onerous was the duty to be performed, that a special executioner was employed. Such was the case at the execution of Charles I. The task of putting this unfortunate monarch to death is well known to have been performed by two men, who, from a dread probably of the vengeance of the Royalists, had concealed their faces under visors. In consequence of the mystery thus assumed, public curiosity was much excited, and several persons fell under the suspicion of having been concerned in the bloody deed; rumor even went so far as to decide who was the wielder of the axe, and who held up the head. It cannot be said, however, that any certainty was ever arrived at on the subject. See *Chambers's Edinburgh Journal*, first series, IV. p. 317.

Like many other offices, that of executioner seems to have been at one time hereditary in England. Shakspeare, in *Coriolanus* (act. ii. scene 1), makes Menenius, one of the characters in the play, speak of 'hereditary hangmen.' In several German states, the office of Headsman (q.v.) also is said to have been hereditary; certain families being thus, as it were, condemned to perpetual infamy. The last headsman of the Tower of London died 1861. The office was latterly a mere sinecure, and has not been filled. In some parts of England, the office was annexed to other posts; for instance, the porter of the city of Canterbury was executioner for the county of Kent, in the time of Henry II. and Henry III., for which he had an allowance of 20s. per annum from the sheriff, who was reimbursed by the Exchequer. The sum of thirteenpence halfpenny was long popularly spoken of as 'hangman's wages,' such sum, equal to a merk Scots, being the fee at one time paid to the executioner when he officiated. In the 17th c., this

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sum, small as it now appears, was considerably above the wages of a skilled mechanic.

From Gregory Brandon, the London executioner in the reign of James I., the name Gregory was employed as a familiar designation for executioners for a considerable period. Brandon had the address to procure a coat-armorial from the College of Heralds, and became an esquire by virtue of his office. One of his successors was named Dun, or 'Squire Dun,' as he was called. Dun is referred to in Butler's *Ghost*, 1682:

For you yourself to act 'Squire Dun,'
Such ignominy ne'er saw the sun.

He was succeeded about the above year by John or Jack Ketch, commemorated by Dryden (*Epilogue to the Duke of Guise*), and his name has since been synonymous with hangman.—Cunningham's *Handbook of London*, article Tyburn.

Executioners have, in some instances, come to trouble. Sentence of death was executed on John Price, the London executioner, 1718, May, 31, for murder. In the account, it is stated that one day, on returning from Tyburn, he was arrested for a debt, which he discharged by a small sum in his pocket, with the proceeds of the clothes of three felons whom he had just then put to death.—*Old Bailey Chronicle*, i. p. 147. If this work can be credited, the executioner was about the same time arrested while accompanying John Meff, a criminal, to Tyburn. This arrest, which is amusingly depicted in an engraving, stayed the execution of Meff; being conducted back to Newgate, his sentence was commuted to transportation for seven years, but having returned to England before the period expired, he was taken and the sentence was executed. In 1736, May 24, the executioner, on returning from Tyburn, after executing sentence on five felons, picked the pocket of a woman of 3s. 6d. (Hone's *Every-Day Book*, ii. p. 695), but what was his punishment is not related. In 1682, Alexander Cockburn, hangman of Edinburgh, was put to death for the murder of a Bedesman, or privileged mendicant. Early in the 18th c., the executioner of Edinburgh was John Dalglish, who acted at the execution of the sentence of Wilson the smuggler 1736, and is alluded to in the *Heart of Mid-Lothian*. It was he also who officiated at the death of the celebrated Maggie Dickson, a woman condemned 1738 for Infanticide, but who came to life again after enduring the sentence of the law, and lived unmolested for years afterward, as a hawker of salt in the streets of Edinburgh. It is said of Dalglish, that, in whipping a criminal, he made a point of laying on the lash 'according to his conscience,' which showed him to have been a most considerate executioner. John High, or Heich, accepted the office of Edinburgh executioner 1784, in order to escape punishment for stealing poultry; he died 1817. See *Traditions of Edinburgh*, by R. Chambers. The emoluments of the Edinburgh executioner at one time comprehended a recompense in kind in the markets of the city—viz., a *lock* or handful, and a *gopen* or double handful, of meal from each sack; hence he received the designation of *lockman*. These emoluments

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were latterly commuted into a regular salary of 12s. per week, besides a free house, and a special fee of £1, 11s. 6d. at each execution; from the Exchequer also the executioner received a small annual allowance as Deemster (see under DEEM). The last of the Edinburgh executioners was John Scott, whom it was customary to confine in jail for eight days previous to an execution, in order to insure his attendance; the expenses incurred by him during one of the periods of seclusion being, as we find, £1, 2s. 6d., which sum was discharged by the city. Scott was killed by a malicious assault 1847. Since this period, Edinburgh has had no regular hangman, but, like all other places in Great Britain, depends on the London executioner, who is hired for the occasion. This personage, until lately, was the well-known William Calcraft. For an execution at Edinburgh 1854, Calcraft's fee and expenses amounted to £33, 14s.; his assistant received £5, 5s.; and for taking charge of both, the city criminal officers were paid £1, 1s.: total expenses for the execution, £40, independently of the cost of erecting the scaffold. In 1815, the magistrates of Glasgow entered into an arrangement by stamped indenture with Thomas Young, who engaged to act as executioner at a recompense of £1 per week, a free house, with coal and candles, a pair of shoes and stockings once a year, and a fee of a guinea at each execution. At Young's death, 1837, his successor, John Murdoch, was recompensed differently. He was paid £1 per month, by way of retainer, and the sum of £10 for an execution. After his death, Calcraft officiated, he in turn having been succeeded by Marwood. Besides the usual fees, executioners have from early times claimed the clothes of those who suffer, as a perquisite of office.

The most noted executioner of Paris was the late M. Sanson, who officiated at the mournful death scene of Louis XVI., and is said to have possessed acquirements and feelings not to be expected from one of his degrading profession. He was latterly assisted by his son, Henri Sanson. See *Memoirs of the Sansons* (1875). The Parisian executioner is familiarly styled 'Monsieur de Paris.'

No professional executioner is employed at capital punishments in the United States. Here the sentence is executed by the sheriff, with the assistance of an under-jailer; this last official performing the fatal toilet of the criminal, while the sheriff, by a movement affecting the drop, puts him to death in virtue of the sentence and the law of the State. This seems an advance on the practice in England, where, however, it could not be introduced, for the reason, that the sheriff there being a magistrate, no one fit for the rank of sheriff or magistrate would accept of office with an obligation to perform the duty of executioner in person. The military executioner attached to an army is styled provost-marshal (q.v.).

EXECUTION OF DEED: performance of the ceremonies required by law in order to make a deed binding and effectual. These ceremonies in England consist in signing, sealing, and delivering. According to the ancient common law of England, signature was not necessary to a

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deed. By 29 Car. II. c. 3 (statute of Frauds), signing was required for almost all deeds. When a party, from any cause, is unable to write, it is usual for him to place his mark in the place of signature. But a mark is unnecessary, and signature by another, at request of the party, is enough. Sealing is the most ancient form of authentication of deeds. In England, deeds are technically known as deeds under seal. A seal is absolutely essential to the validity of an English deed, but any species of seal is sufficient, and in practice a common wafer is usually appended. Delivery is the third requisite to authenticate a deed. Delivery may be made either to the grantee or to another person for him. In the former case, the deed becomes absolute; in the latter, it is called an *Escrow*, and does not acquire its full effect till the conditions are fulfilled. Witnesses are not absolutely required to a deed in England, but in practice it is usual that one witness should attest. Before execution, a deed must be read, if required, by a party to it; and if not read, it is void as to the party requesting. Where a person is ordered in Chancery to execute a deed or other instrument, and is in prison for failure to comply with the order, the court may make an order that the instrument be executed by the officer of the court; and the execution having been so made, the instrument is equally valid as if signed by the party. In the execution of wills in England it is required that every will shall be signed at the foot or end by the testator in presence of two witnesses: see WILL.

In Scotland, sealing was formerly an essential requisite for execution; but that practice was dispensed with in regard to registered deeds, and has long fallen into disuse. The signature of the maker of the deed is required, and the presence of two witnesses. If the maker of the deed cannot write, the deed is signed in his presence by two notaries, in presence of four witnesses; a will, by one notary with two witnesses. Subscription by initials has been permitted in Scotland, but is irregular, and requires proof that *de facto* the signature was so made. A deed or other instrument the whole or the essential parts of which are holograph, i.e., in the testator's handwriting, is valid without witnesses. Bills and promissory-notes, receipts, and mercantile accounts do not require to be holograph or attested.

In the United States, a deed is not good against a subsequent purchaser, except it be acknowledged before the proper official, and duly recorded by the public registrar appointed for such office. The law varies as to witnesses; in some states acknowledgment before a magistrate suffices without witnesses; in others one witness, and in still others two, are required.

EXECUTION OF THE DEATH SENTENCE: capital punishment (q.v.). Executions took place publicly in the British Kingdom till 1860, when an act of parliament was passed requiring that they should take place within the precincts of a prison, in the sight of certain officials newspaper reporters, and others invited to be present. The United States

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(to some extent), Bavaria, and the colony of Victoria had previously adopted this method. The lack of that terror with which public executions were supposed to strike the multitude is, by this private procedure, held to be more than compensated by the prevention of a brutaiizing public spectacle. In London, executions took place for the most part at Tyburn until 1783, when a scaffold erected in front of Newgate prison became the common place of execution. 'The gallows was built with three cross-beams for as many rows of sufferers; and between 1785, Feb. and Dec., 96 persons suffered by the "new drop," substituted for the cart. About 1786, here was the last execution followed by burning the body; when a woman was hung on a low gibbet, and life being extinct, fagots were piled around her and over her head, fire was set to the pile, and the corpse burned to ashes. On one occasion the old mode of execution was renewed: a triangular gallows was set up in the road opposite Green-Arbour Court, and the cart was drawn from under the criminal's feet.'—Timbs's *Curiosities of London*. To render executions more impressive, they were in some cases ordered to take place near the scene of guilt. About 40 years ago, two men were hanged at Bishopbriggs, near Glasgow, in sight of the scene of a murder that they had committed. The ordinary place of execution in most towns in Great Britain and Ireland is outside the prison. At Edinburgh, executions took place chiefly in the Grassmarket, until 1784, when they were transferred to a platform at the w. end of the Tol-booth, a building removed in 1817. The interval between sentence and execution is about three weeks, the nature of the crime not making any difference in this respect. In all parts of the British Empire, the convict under sentence of death is allowed to make choice of the spiritual adviser who shall attend on him; and generally, everything that humanity can suggest is done to assuage the bitterness of his fate. At one time, the bodies of murderers after execution were, in terms of their sentence, delivered to professors of anatomy for dissection; and it appears that in some instances the mangled corpse was made a kind of public show. Thus it was at the execution of Earl Ferrers, 1760. The body having been conveyed from Tyburn in his lordship's landau-and-six to Surgeon's Hall, was, after being disemboweled and laid open in the neck and breast, exposed to public view in a first-floor room. A print of the time depicts this odious exhibition. The ordering of the bodies to be dissected, having led to great abuse, was abolished 1832; since this period, the bodies of murderers are buried within the precincts of the prison, and the bodies of other malefactors are given to their friends: see ANATOMY (in Law). It was also at one time customary to hang the bodies of certain malefactors in chains after execution—as, for example, the bodies of pirates were so hung on the banks of the Thames—but this usage, revolting to public feeling, is likewise abandoned. From the improved state of the criminal law, death sentences are now comparatively rare, and still more rarely are such sentences executed, for, except in cases of deliberate and aggravated murder, the extreme sentence of

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the law is now usually commuted by the crown into penal servitude for life. The secretary of state for the home department, however, exercises his power in this respect with much care and discretion; and the element of arbitrariness, which might be supposed to spring from differences of temper in different home secretaries, is very seldom obvious.

A great change took place in the public attendance at executions before they were discontinued. Formerly, persons belonging to the higher and middle ranks were habitually present at these dismal exhibitions; many hiring windows at a considerable sum for the occasion. Literature furnishes us with various instances of persons of cultivated mind attending regularly from a morbid love of the spectacle. George Selwyn was fond of seeing executions. His friend Gilly Williams, writing to him of the condemnation of John Wesket (1765, Jan. 9) for robbing the house of his master, the Earl of Harrington, says: 'Harrington's porter was condemned yesterday. Cadogan and I have already bespoke places at the Brazier's. I presume we shall have your honour's company, if your stomach is not too squeamish for a single swim.'—Selwyn's *Correspondence*, I. p. 323. The Earl of Carlisle, writing to Selwyn, speaks of having attended the execution of Hackman, a murderer, 1779, April 19.—*Ibid.* IV. p. 35. James Boswell, biographer of Johnson, had a passion for seeing executions, and even for accompanying criminals to the gallows. He was indulged with a seat in the mourning coach to Tyburn, with the above named Hackman, the ordinary of Newgate, and sheriff's officer. Visiting Johnson, 1784, June 23, he mentions that he has just come from the shocking sight of 15 men hanged at Newgate.—Boswell's *Johnson*, VIII. p. 331, Croker's edition. At public executions there were to the last considerable crowds, but they consisted chiefly of the lowest of the population. During the excesses of the French Revolution, the executions in Paris were enjoyed as a spectacle by crowds of female Jacobins. From the circumstance of these furies employing themselves with knitting needles while attending daily at the scaffold, they became familiarly known as the *Tricoteuses* (Knitters).

In most of the states of the American Union, the laws direct that the E. of the death sentence shall take place within the precincts of prisons; but in some s. states the act is performed in an open field, in full view of the multitudes that eagerly attend such exhibitions. For the crimes punishable with death under the laws of the several states of the American Union, see in general, CAPITAL PUNISHMENT.

The mode of the E. of the death penalty is throughout the United States that of hanging, except in N. Y. In 1888 the legislature of that state changed the form of E. of the death penalty from hanging to electricity. Soon afterward, William Kemmler, convicted of murder in the first degree, was sentenced to suffer death by the application of electricity, which was deemed much less revolting to humanity than death by the usual mode of

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hanging. The prisoner's counsel, claiming that such form of punishment was of the 'cruel and unusual' class prohibited by the state constitution, applied for a writ of *habeas corpus* for the purpose of testing the constitutionality of the new law. A great mass of testimony on this application was taken in New York during the summer 1889. The merits of the alternating and continuous currents produced by the systems of rival corporations were advocated and disputed by experts; the amount of voltage necessary to produce instantaneous death under favorable and unfavorable conditions was variously asserted; and the results of many experiments with different animals were detailed. Oct. 9, the judge, after reviewing at length the testimony in the case, decided that the new law was constitutional; and Dec. 30 the general term of the fifth judicial dept. reaffirmed this decision. While the question of constitutionality was being thus tested, preparations were in progress in the Auburn state prison to carry out the sentence of death during the week beginning 1890, Apr. 28, and the 30th was chosen for the day. The night previous, however, the warden of the prison was served with a writ of *habeas corpus* sued out by the convict's counsel in the U. S. circuit court; and the infliction of the death penalty was thus deferred, awaiting a decision by the court. This writ having been dismissed, the culprit was again sentenced, July 3, to die during the week beginning Aug. 4. The sentence was executed 1890, Aug. 6, in the Auburn prison.

The death chamber, 17 x 25 ft. in size, contained the death chair; a board to which were attached the mechanical appliances for testing, measuring, and governing the current; a Cardrews voltmeter; a box containing a current-reducing coil; a switch between the voltmeter and the reducer; a box containing 24 16-candle-power incandescent lamps to show when the current was running steadily; two switches for short-circuiting the current and for carrying it to the wires at the death chair; an electric push-button for signalling with the dynamo room, 1,000 ft. distant; and two wires connecting directly with the dynamo. The death chair had a sloping back and broad arms, with straps to bind the prisoner's arms, feet, and chest to the chair. Attached to the back of the chair was a figure-4-shaped wood frame, adjustable to the height of any prisoner's head, one portion of the frame passing over and beyond the head. It was first designed to have the current pass through the prisoner from head to foot, but afterward it was deemed best to send the current from the head to the small of the back. Accordingly small rubber disks, containing a plate of metal, a sponge, and a coil of copper wire, were prepared, to be placed on the head and at the base of the spine. One of the long wires passed through the wood projection over the head to the rubber disk on it, and the other to the disk placed against the spine.

EXECUTION ON CIVIL PROCESS.

The manner of the execution in this case was as follows: The convict having been strapped in the chair, and the electrodes having been fitted to the vertex and the base of the spine respectively, the current of electricity was turned on. The face and hands of the convict first turned deathly pale, then dark red; the fingers seemed to grasp the chair with a firmer hold, and the nail of the index-finger of the right hand cut into the palm. The current had flowed abt. 17 seconds when a physician declared the man dead, and the machinery was instantly stopped; but that moment the man gave, or seemed to give, signs of life and of intense suffering: a deep groan came from his lips, and there was a violent struggle for breath; the body relaxed and grew limp, and foam came from the mouth. The current was again turned on and kept up for 2 minutes, intermittently: the man was then pronounced dead; the electrode had burned the flesh deeply at the base of the spine. One of the physicians present at the execution declared the signs of life and voluntary movement, observed after the current had first been stopped, to be merely reflex movements—'similar to those which have occasionally been observed, for a short time, in animals experimentally killed by electricity, after the current was too quickly interrupted, the animal, however, not recovering consciousness nor life; hence they may properly be regarded as involuntary muscular movements of a reflex character, following the interruption of the current, and in no sense a resumption of normal respiration, however much they may appear to be so to a superficial observer, or to one not familiar with the phenomena in animals above referred to. These movements are as nothing compared with those usually exhibited by animals suddenly decapitated, and which usually continue for some seconds or even minutes. If there was a spark of unconscious vitality remaining in the body after the first contact was broken—there certainly was no conscious life—it was absolutely extinguished the instant the second and last contact was made.'

See CAPITAL PUNISHMENT: DROWNING: GUILLOTINE: HANGING: MAIDEN: NEWGATE: PARRICIDE: PEINE FORT ET DURE: PRESSING TO DEATH: TYBURN: WHEEL (BREAKING ON THE): also EXECUTIONER.

EXECUTION ON CIVIL PROCESS: method whereby the English High Court enforces its judgment on the person or estate of those against whom judgment has been given. The common law of England allows four different writs to issue against refractory debtors—viz., a *fieri facias* (called commonly a *fi. fa.*), by which goods and chattels of a debtor may be attached; a *capias ad satisfaciendum* (*ca. sa.*), directed against the person of a debtor (not a privileged person)—regarded as the last remedy, involving imprisonment till the debt is paid, and not issued unless fraud is involved; *levari facias* directed against a man's goods and the profits of his lands (now seldom used); and *elegit*, a writ of very ancient date, directed against the land^s themselves: see

EXECUTION ON CIVIL PROCESS.

ELEGIT. In the chancery division of court, execution against the person is by writ of attachment: see **ATTACHMENT**, in Law. In all cases execution may issue immediately, each writ being renewable after a year, within six years; but the court or judge can stay execution to a time fixed—or subject to conditions.

Execution for debt in Scotland, or as it is technically expressed, diligence in execution, is either real or personal: by the former, the debtor's land may be attached; by the latter, his person and his movables. In the case of bonds and other instruments registered for execution (see **REGISTRATION**), the law allows summary diligence to proceed, without further application to the court. Diligence against heritage includes **INHIBITION: ADJUDICATION: RANKING AND SALE: POINDING OF THE GROUND:** Personal diligence is by **HORNING AND CAPTION: ARRESTMENT:** and **FORTHCOMING:** see these several titles.

In the United States the term 'execution' is generally used to denote the act of carrying into effect the final judgment of a court, or the writ given to an officer, usually a sheriff, constable, or marshal, authorizing him to enforce such judgment. A judgment, however, does not always form the basis of the writ, for under certain statutes the writ may be issued without first obtaining a judgment. As a general rule the word 'execution' is used to signify 'a writ issued to enforce a judgment or order of a court of law' (*Freeman on Executions*). The writ follows the judgment and commands the officer to do the things which will make it effectual, but it cannot exceed the judgment. Upon money-judgments there is usually but one form of writ employed whether to reach real estate or to reach personal property, and in it the officer is commanded to levy upon the personal property. If that is insufficient he is directed to seize the real estate. At the present day, it may safely be asserted, that the right of a court to issue a judgment necessarily carries with it the right to award an E. to enforce the same, unless this right is expressly restrained by statute. In some cases E. may be issued out of a court other than that in which the judgment originated. This is done by first filing a transcript of such judgment with an officer designated by law. E. can issue only upon final judgment, which must be sufficiently definite in all essential respects. An E. may be issued against any person who would be bound by the judgment. To this rule, however, there are exceptions as in the case of certain municipal officers and persons acting in representative capacity. In a proper case, to avoid abuse, parties may be prevented from issuing E. by what is known as a 'stay of execution.' Sometimes the defendant is required to give security before a stay will be granted. After an E. has been once issued, and it is necessary to issue another, it may be done, and it is then called an *alias*. Writs issued after the *alias* are known as pluries writs. The remedy against an E. improperly issued, is a motion to set the same aside.

At common law, all the debtor's personal property which could legally contribute to satisfy the judgment and all legal

EXECUTIVE DEPARTMENT.

interests in lands held by him were subject to E., but in most of the American states, exemption laws have been enacted which are liberally construed and which—to shield the debtor and his family from immediate want—reserve from the effect of an E. certain household furniture, tools, provisions, and the like. If proper formalities have been complied with, a certain designated amount of real estate called a 'homestead' also is exempted.

The bringing of the property by the officer under control of the E. is known as a 'levy.' Upon personal property, depending largely upon its nature and the circumstances, the officer makes a levy by going where such property is situated, keeping it in view and assuming or asserting dominion over it. The levy to be valid must not be secret. But it is not necessary that the property be taken out of the defendant's custody. Levies upon real estate are not to be made until the personal property has been first levied upon. In the case of real estate, under very diverse practice in the different states, the officer does not usually go upon the land, but either advertises the same for sale, or makes an entry upon the writ descriptive of the premises, or files in the proper office a copy of the writ with a notice to the effect that the real estate has been attached. Sometimes he is required to post a notice upon the land and in other conspicuous places, or to deliver a copy of the writ to an occupant of the property. Executions against the person are allowed in the different states in cases of fraud, embezzlement, personal actions, and when there is danger that the defendant will leave the state with intent to defraud his creditors, or when he conceals his property with like intent. Executions awarding the possession of real or personal property also are allowed. These are usually called 'writs of possession.' In carrying out such writs, the officer is vested with all powers requisite to accomplish his purpose, and may if necessary use force.

EXECUTIVE DEPARTMENT: branch of a national, state, or municipal govt., or of a corporation; having charge of the enforcement of laws, ordinances, rules, resolutions, and other directions of the superior body from which it derives its existence and powers. In the U. S. govt., the president is the chief of the E. D., and is assisted by the secretaries of the depts. of war, navy, treas., state, interior, agriculture, and the postmaster gen. and atty. gen., who constitute 'the president's cabinet.' Through these secretaries and under the entire control and direction of the pres., all the business of the govt. is carried on, the statutes enforced, and the special laws of congress put into operation. Each subordinate dept. is subdivided into minor ones, usually called Bureaus, according to the exigencies of its particular service, and the officers in charge of them are directly responsible to the sec. of the dept., and he in turn to the pres., who is frequently designated 'the chief executive.' The same general custom prevails in the states and principal cities, the gov. and mayor being the chief executives, and having various officers to assist in the administration.

EXECUTOR OF A WILL.

EXECUTOR OF A WILL: the person to whom, by the testator's own appointment, has been committed the execution of a last will and testament. If the person is a woman she is styled 'executrix.' Where a person dies without having left a will, or has left a will but appointed no E., or an E. has been appointed who is incapable of acting as such, or who refuses to act, or has acted but partially, an administrator may be appointed by a court, having jurisdiction of probate matters. The E. is said to derive his authority from the will, while the administrator's power is created by the order of a court. Many of the historical distinctions between these two classes of officers, have in the development of the law become obliterated. Though the technical distinctions as to the name are preserved in the law, at present the duties of executors and administrators are substantially the same, except that if no will at all was made, the intestate's estate is divided according to some statute prescribed by the state, while in the case of a will, the distribution takes place in the manner directed by the will. A manifest advantage however is secured to the estate of a dying person by making a will and appointing executors, since in such a case, a possible conflict as to who shall carry out the wishes of the deceased may be avoided. Furthermore such executors, on making probate, are not usually required to give bonds, while administrators appointed by the court are always required to furnish security. A will however, is not made void by reason of a failure to appoint therein an executor. Originally the operation of wills was confined exclusively to personal property, and the E. or administrator had nothing to do with the deceased person's real estate. This was owing to the rules of the English common law by which real estate at once vested in the heir-at-law upon the death of the owner. At present in the United States, while personal property still remains the basis around which the E.'s and administrator's functions are concentrated, they may be called upon to exercise a certain supervision over real estate where the E. is in fact directed to do so in the will, or where, by reason of a deficiency of personal assets the real estate of the deceased is applied in payment of the latter's debt.

In a general sense, it may be said that whoever is capable of making a will, is capable of acting as E. The court however, in the interests of creditors and legatees, have power either to remove an obviously incompetent E. or on cause shown to exact security from him. The executorship being a personal matter cannot be assigned to anybody else, and upon the death of the E. his duties will be performed either by the surviving executors, if more than one was originally appointed, or by an administrator to be selected by the court, with due regard to all the circumstances of the estate. The E., though he derives his power primarily from the will, is not officially recognized until the will is admitted to probate and his authority confined by the issuance to him from the court of what are termed 'letters testamentary.' In the case of an administrator they are called 'letters of administration.' In case of

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administration, no probate is made. A person who without authority officiously intermeddles with the estate of the deceased, is styled an 'executor de son tort' (executor of his own wrong). Such a person, if not acting in good faith, is liable to persons injured by his acts to the extent of the property which he may have taken or the actual damage caused by him.

The duties of the E. and administrator are to make and file an inventory of the deceased's property, to pay his debts and funeral expenses, collect all his assets, and distribute the same among those entitled thereto. They must at all times keep accurate accounts of their doings. They may be compelled to make an accounting during the progress of their trust, also on finally closing the same. In American practice executors and administrators who have faithfully performed their duties are allowed compensation varying in different states, but generally taking the form of commissions on the amounts received and paid out. See for Scotch usage, DEAD'S PART: CONFIRMATION: VITIOUS INTROMITTER.

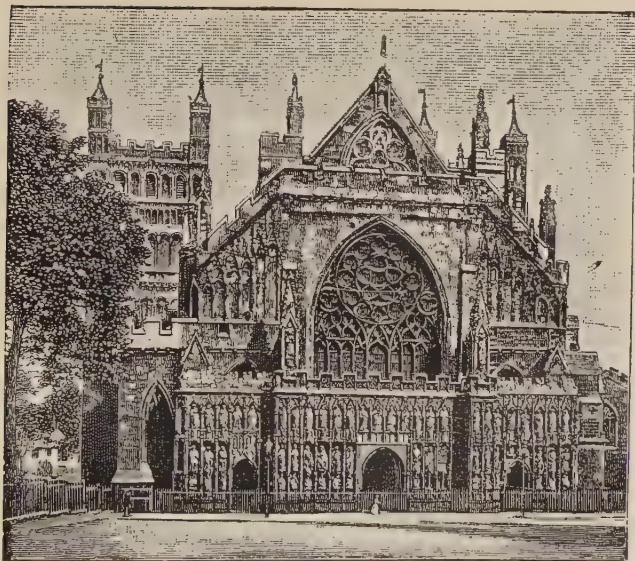
EXECUTORS, in Scotland: heirs *in mobilibus* (of movable possessions) of a person deceased intestate. They are the whole next of kin in the nearest degree in blood; but where the heir to the heritage is one of the nearest of kin (e.g., the oldest son), he is not entitled to share in the movables without collation (q.v.). See SUCCESSION: MOVABLES.

EXECUTORY DEVISE', in Law: such a limitation of a future estate or interest in lands or chattels (though in the case of chattels, it is more properly a bequest) as the law admits in the case of a will, though contrary to the rules of limitation in conveyances at common law (Blackstone, *Comm.* ii. 334). By common law, a freehold cannot be limited on a freehold, as an estate to A and his heirs; but if he die before he attain the age of 21, then to B and his heirs. Nor can an estate be given to commence at a time uncertain, as to A when he returns from Rome. But though these limitations would be void in a deed, common law will sustain them as executory devises. This form of limitation is restrained by the law against Perpetuities (q.v.), which requires that the estate must take effect within a life or lives in being and twenty-one years after. The law will not interpret a limitation as an executory devise, if it can be otherwise sustained. Within the period allowed for these estates, an executory devise constitutes a species of estate tail; and for this purpose, it is frequently used in America.

EXEDRA, n. *ēgs'ē dra* or *ēgs-ē' drá* [L. *exedra*—from Gr. *ex*, out, without; *hedra*, a seat: F. *exédre*]: in *antig.*, the portico of the Grecian palaestra, in which disputations of the learned were held; so called from its containing a number of seats, generally open, like the *pastas* or vestibule of a Greek house; an assembly-room or hall for conversation; in *arch.*, a niche projecting beyond the general plan of a building; a porch or chapel projecting from a large building; a recess of a building.



Excubitorium or Watching-loft, St. Albans.



EXEGESIS.

EXEGESIS, n. *ěks'ě-jě'sis* [Gr. *exēgēsis*, a leading out, an exposition—from *ex*, out of; *egōmai*, I lead: F. *exégèse*]: critical exposition or interpretation of any writing, but usually, of a portion of Scripture; a paraphrastical explanation of any text or portion of Scripture. **EX'EGETE**, n. *-jět*, one skilled or practiced in exegesis; an exegetist. **EX'EGET'ICAL**, a. *-jět'ī-kāl*, expository; tending to illustrate or explain; also **EX'EGET'IC**. **EXEGETICS**, n. *-jět'iks*, proper scientific interpretation, especially of Scripture. **Hermeneutics** and **Exegetics** are close allied but not identical. The former lays down the principles of Biblical interpretation; the latter deals with the practical application of the principles. In other words, **Hermeneutics** is a science, **Exegetics** is an art. **EXEGETIST**: same as **EXEGETE**. **EX'EGET'ICALLY**, ad. *-lī*.—*Exegesis* is applied usually in connection with biblical writings. The expositor or interpreter is called an *exegete*. To interpret a writing, means to ascertain thoroughly and fundamentally what are the conceptions and thoughts which the author designs to express. For this purpose, it is necessary, in regard to books written in a foreign language, that the exegete should know well, first, the precise signification of the words and idioms employed by the writer: this is *grammatico-philological* exegesis. In the next place, he must be acquainted with the things denoted by these words, also with the history, antiquities, and modes of thought of the nation: this is termed *historico-antiquarian* exegesis. Both together constitute *grammatico-historical* exegesis. When only an exposition of the system of thought contained in a writing is sought after, this is termed *doctrinal* or *dogmatic* exegesis; while the investigation of a secret sense, other than that literally conveyed by the words of a writing, is termed *allegorical* exegesis. But if a writing is regarded from a practical point of view, and in reference to its bearing upon life and manners, the exposition is termed *moral* exegesis. The complete and coherent exegesis of a writing forms what is called a *commentary*, but, if restricted to certain difficult words or knotty points, the elucidations are termed *scholia*. The scientific exhibition of the rules and means of exegesis is called *Hermeneutics* (q.v.). In the earliest ages of the Christian Church, the allegorical method of exegesis prevailed. By the Alexandrian school in particular, it was greatly abused. Origen, however, the greatest of this school, has the credit of an endeavor to secure a basis for grammatical exegesis, by a sharp separation of the literal, the moral, and the mystical sense of Scripture. Besides the Alexandrian school, the Syrian *historico-exegetic* school had many adherents in the East. Among these may be mentioned Cyril of Jerusalem, Ephraem Syrus, John Chrysostom, and Theodorus of Mopsuestia. First, toward the end of the 4th, and during the 5th c., a narrowing of the principle of the free interpretation of Scripture begins to be observable, through the rapid development of monkery and the hierarchical system; in consequence of which, the importance of the classic writers was undervalued, and the study of them ultimately abandoned in the Western Church, while a feeling of

EXEGESIS.

superstitious reverence, wholly unintelligent and unscriptural, grew up for the letter of the 'Word,' and exegesis, if employed at all, was employed simply to bolster up preconceived views. By and by, independent exegesis was supplanted by the well-known *Catenæ*, consisting of expositions of books of Scripture strung together from the writings of the older church Fathers. In the East, the first of these was got up by Procopius, 520; in the West, by Primasius, 550. Although much was done for the exegesis of the Old Testament by eminent Jewish scholars, such as Solomon Jarchi, Aben-Esra, and David Kimchi, Christian theologians for the most part, knowing only the text of the Vulgate, stuck, during the dark ages, to the interpretations of the Fathers. First in the 12th, 13th, and 14th c., efforts were made by individual scholastics, especially by Abelard, St. Bernard of Clairvaux, Thomas Aquinas, and Nicholas of Lyra, to re-introduce something like a grammatico-historical exegesis of Scripture. But it was mainly to the great revival of letters in the 15th c., and the humanistic scholars whom it produced, such as Laurentius Valla, Erasmus, etc., that an advance in exegesis was owing. The Complutensian Polyglot also exercised a great and beneficial influence. Shortly afterward, the Reformation gave an impulse to exegesis, so powerful, that it is felt at the present day; and, indeed, its effect is far more visible in the recent biblical criticism of Germany than it was in the days of Luther himself. The desire for the unfettered exegesis of Scripture strongly animated the reformers, but, in fact, the long black night of ignorance—known as the dark or middle ages—influenced them too, and disqualified them for framing at once a comprehensive exegetical science. It required two centuries to recover from the effects of mediæval ignorance. The more important Lutheran exegetes are: Luther, Melancthon, Brenz, Joach. Camerarius, Strigel, Chemnitz, etc.; of the Reformed or Calvinistic school may be mentioned Calvin, Zwingli, Œcolampadius, Bucer, Beza, Bullinger, Grotius, Clericus, etc.; and of the Rom. Catholics, especially Paul Sarpi. During the 17th c., the exegesis of Scripture was for the most part at a stand still, but about the middle of the 18th c. it suddenly revived. This revival is due principally to Joh. Aug. Ernesti (q.v.), and J. Sal. Semler (q.v.), who established new principles of criticism and hermeneutics, through which grammatico-historical exegesis once more made its appearance. The labors of Wetstein and Kennicott in regard to biblical mss. were of immense service. Since their day, till the present, criticism has been constantly at work on the writings of the Old and New Testament. Cognate languages have been more and more profoundly studied; the antiquities of the East, of Egypt, Assyria, Arabia, and other countries, have been investigated, and brought to bear on the subject; the manners and customs in these lands, and which, in some of them, have prevailed from time immemorial; the laws that determine the growth of civilization in nations, and enable us to enter into and comprehend the condition of mind peculiar

EXELMANS—EXEMPLIFY.

to races in a primitive stage of development, and to appreciate their modes of thought, and to weigh the value of their literary and religious records—all these have received, and are receiving careful attention from numerous scholars, so that it is not too much to say that we are at the present day better fitted—so far as outward helps go—to understand the real meaning of Scripture, than those who have lived at any other period subsequent to its composition. Among the eminent names in the recent development of biblical exegesis are F. A. Wolf, J. Dav. Michaelis, Eichhorn, Gesenius, Wahl, Bretschneider, Winer, Rosenmüller, Hitzig, Hirzel, Ewald, Umbreit, De Wette, Knobel, Lücke, Paulus, Meyer, Olshausen, Hengstenberg, etc. The influence of the *grammatico-critical*, and *critico-historical* exegesis of modern Germany, is beginning to make itself felt in Britain and the United States. Among important contributions to the science recently made by British scholars, are those by Conybeare and Howson, Alford, Stanley, Jowett, Ellicott, etc. In the United States a vigorous and profound class of exegetes is now in training, and will soon show valuable results.

EXELMANS, *ěks-ěl-mǎng'*, REMY JOSEPH ISIDORE. Comte: 1775, Nov. 13—1852, July 22; b. Bar-le-duc: French general. He entered the army 1791, was promoted to capt. 1799, served with distinction in the campaign of Naples under Macdonald and Championnet, and 1801 was attached as aide-de-camp to the staff of Murat. In 1808, while with Murat in Spain, he was arrested and sent to England, where he remained a prisoner three years. He was with Napoleon in the Russian campaign 1812, for his brilliant conduct in which, the emperor created him gen. of division. E. seems to have been esteemed equally under every successive government. On the fall of Napoleon, he was for some time banished from France, but was permitted to return 1819. In 1831 Louis Philippe restored his titles and rank. Louis Napoleon named him grand chancellor of the Legion of Honor, and 1851, March 11, raised him to the dignity of *Maréchal de France*. His death was the result of a fall from his horse.

EXEMBRYONATE, a. *ěks-ěm'brī-o-nāt*, a.: in bot., not having an embryo. Used of Cryptogamic, or as Richard calls them, Inembryonate plants; so designated from their not possessing a proper embryo like Phanerogams.

EXEMPLAR, n. *ěgz-ěm'plēr* [F. *exemplaire*, a pattern, a sample—from mid. L. *exemplārium*; L. *exemplar*, a pattern—from L. *exemplum*, a sample]: anything to be copied or imitated; a model. EXEMPLARY, a. *ěgz-ěm-plēr-ī*, serving for a pattern or model for imitation; such as may serve as a warning to others: N. copy of a book or writing. EXEMPLAR'ILY, ad. *-ī-lī*. EXEMPLAR'INESS, n. the state of being a pattern for imitation.

EXEMPLIFY, v. *ěgz-ěm'plī-fī* [L. *exemplum*, a sample, a copy, a transcript; *faciō*, I make]: to show or illustrate by example. EXEMPLIFYING, imp. EXEMPLIFIED, pp. *-fīd*. EXEMPLIFIER, n. one who. EXEMPLIFICATION, n.

EXEMPLI GRATIA—EXERGUE.

f'ŷ-kā'shūn, the act of illustrating; an illustration by example; an attested copy.

EXEMPLI GRATIA, *ĕgz-ĕm'plī grā'shī-ū* [L. *grātīā*, for the sake; *exemplī*, of example]: for instance; contracted into Ex. GR., or more usually into E. G.

EXEMPT, a. *ĕgz-ĕmt'* [F. *exempter*, to exempt, to free—from L. *exemptus*, taken out, freed—from *ex*, out of; *emptus*, bought]: not liable to; free from any service, tax, evil, etc.; not included: V. to free from any charge, burden, evil, etc.; to privilege. EXEMP'TING, imp. EXEMP'TED, pp. EXEMP'TION, n. *-ĕm'shūn* [F.—L.]: freedom from any service, charge, evil, etc., to which others are subject; privilege.

EXENCEPHALOUS, n. *ĕks-ĕn-sĕf'a-lūs* [prefix *ex*; Gr. *engkephalos*, within the head, the brain]: in *anat.*, malformed human being or animal in which, from defect in the cranium or skull, the brain is visible or even protrudes.

EXEQUATUR, n. *ĕks'ĕ-kwā'tēr* [L. *exēquātūr* for *exēquātur*, let him perform]: a written authority whereby a consul or commercial agent may be recognized.

EXEQUIES, n. plu. *ĕks'ĕ-kwō'z* [L. *exēquīās*, the following a corpse, a funeral procession or rites—from *ex*, out of; *sēquor*, I follow: It. *esequie*]: the ceremonies or rites at a funeral—*obsequies* commoner. EXE'QUIAL, a. *-ĕ'kwō-āl*, pertaining to funeral rites.

EXERCISE, n. *ĕks'ēr-sīz* [F. *exercice*, an exercise—from L. *exercitiūm*, exercise—from L. *exercĕō*, I drive on or keep busy—from *ex*, out of; *arcĕō*, I shut up]: any labor or exertion of the body to promote health or for amusement; any exertion as in a profession, business, or employment; practice; application of the mind; a lesson or example for practice: V. to exert; to cause to act in any manner; to train by use; to discipline; to use exertion for amusement, health, or proficiency; to keep employed. EX'ERCISING, imp. EX'ERCISED, pp. *-sīzd*. EX'ERCISABLE, a. *-a-bl*, that may or can be exercised, used, employed, or exerted. EX'ERCISER, n. one who. EXERCITATION, n. *ĕks-ēr'sī-tā'shūn* [L. *exercitātiōnem*]: practice—same as *exercise*.—*Exercise* is an indispensable element of health; to allow complete inaction of any part or function, is to initiate disease, probably even structural change, or atrophy. Hence the development of the muscular system, of the secretions, and even of the mind and its organ, the brain, require the more or less regular use of exercise, either in the form of productive and useful work, or by means of artificially devised methods calculated to serve a like purpose in regard to the economy: see GYMNAS-TICS. The best regulated life is that which secures due and proportionate exercise with intervals of due and proportionate rest, for all the functions, mental as well as bodily.

EXER'CITOR, n. [L.]: in *law*, the person to whom the profits of a ship belong, whether he be owner or hirer.

EXERGUE, n. *ĕks-ĕrg'* [F. *exergue*—from Gr. *ex*, out of; *ergon*, work]: the small space on the face of a medal or coin left for a date, name, etc.—usually beneath the base-line of the subject engraved.

EXERT—EXETER.

EXERT, v. *эгз-эрт* [*L. exsērtus*, thrust out, put forth—from *ex*, out of; *sērō*, I join or bind together]: to put into action, as strength, or the mind; to use with effort; to bring into active operation; to strive. **EXERTING**, imp. **EXERTED**, pp. **EXERTION**, n. *-эр shūn*, effort; the act of striving or straining.—**SYN.** of 'exertion': attempt; endeavor; trial; experiment; essay; struggle.

EXETER, *экс-э-тэр*: town of Rockingham co., N. H.; on the E. river and the Boston and Maine railroad; 12 m. s.w. of Portsmouth, 17 m. s.s.w. of Dover, 51 m. n. by e. of Boston. E. is built around the falls on both banks of the river at the head of tide water; contains a court house in which sessions of the state and the United States circuit and dist. courts are held, 7 churches, public library, several schools, 1 national bank (cap. \$100,000), and 2 savings banks, woolen mill, pottery, machine shop, cotton mill, 3 grist mills, and several carriage factories. It is noted chiefly as the seat of an acad. founded by John Phillips, LL.D., who bequeathed to it a large portion of his estate 1781 (see **PHILLIPS EXETER ACAD.**), and of the Robinson Female Seminary, organized 1869 with an endowment of \$300,000. This ancient town is noted for culture and intelligence. E. was settled 1638, suffered by Indian wars 1690–1710, and was the cap. of the state during the revolutionary war.—Pop. (1880) tp. 3,569; (1890) 4,284.

EXETER, *экс-э-тэр* (the *Cær-Isc* of the Britons, the *Isca Damnoniorum* of the Romans, *Exancester* of the Saxons): city, episcopal see, separate county, parliamentary and municipal borough, and river-port, in the s.e. of Devonshire, and the cap. of that county. It is on an acclivity on the left bank of the Exe, 10 m. n.w. of its mouth, 170 m. w.s.w. of London, 73 m. s.w. of Bristol. It is on the whole well built and clean, and has two main lines of street meeting near the centre. There are some fine squares and terraces. The Guildhall has a singular portico, added 1593, and projecting into the street. It was restored, with considerable regard to artistic effect, 1864. In 1865 an elegant new post-office was erected; also a lunatic asylum, just outside the city. A quadrangle of almshouses, 45 in number, was completed 1866, with a church attached; and the Albert Memorial Museum was opened 1868. Exeter cathedral, magnificent in its ornamentation, was erected 1112–1478. It has Norman transeptual towers; but most of it is in the decorated style. The church was carefully restored 1870–77, by Sir Gilbert Scott. In one of its towers is the great Tom of Exeter or Peter's Bell, 12,500 lbs. weight, and a large curious antique clock. E. has a large floating ship-basin, 917 ft. long, 90 to 110 ft. broad, and 18 ft. deep; and a ship-canal, 15 ft. deep and 30 ft. broad. This canal extends 5 m., and terminates at Turf, about 2 m. from the head of the estuary of the Exe. E. has magnificent nurseries, and exports dairy, farm, and orchard-produce from a neighborhood rich in such products. The town sends one member to parliament. E. was anciently the chief residence of the W. Saxon kings. Exeter bishopric, fixed here 1050 by Edward the Confessor, in-

EXETER COLLEGE—EXHALE.

cludes Devon and Cornwall, 23 deaneries and 588 benefices. The city was formerly surrounded with walls and strongly fortified. On a height n. of E. are the ruins of Rougemont Castle, built by William I., on the site of one said to be as old as Cæsar's time. Many Roman and Greek coins have been found in E., besides tessellated pavements, fragments of columns, and small bronze statues.—Pop. of parliamentary borough (1881) 47,154.

EXETER COLLEGE, Oxford: founded 1314, by Walter de Stapledon, Bp. of Exeter, who removed from Hart Hall to the present site of E. C., a rector and twelve fellows. In 1404, Edmund Stafford, Bp. of Salisbury, added two fellowships, and gave the college its present name. Sir William Petre, 1565, founded eight more; and 1636, Charles I. annexed one more for the islands of Jersey and Guernsey. In 1770, Mrs Sheers left certain rents for the establishment of two fellowships. All these fellowships were originally appropriated to various archdeaconries or counties, especially in the west of England. A peculiarity in this college was, that the above foundations, though generally called fellowships, were, strictly speaking, only scholarships. Important changes were introduced under the authority of 17 and 18 Vict. c. 81. The number of fellowships was reduced to 15—all open without any restriction as to place of birth. The revenues of two fellowships were divided among the rectorship and the 15 fellowships. The remaining eight fellowships were devoted to the foundation of 22 scholarships; ten open without restriction; ten limited to persons born, or for three years educated in the diocese of Exeter; and two limited to persons born in any of the Channel Islands. Several exhibitions also are attached to the college; and there are about 16 benefices in the gift of the Society. The number of names on the books is about 750.

EXETER (or EXON) DOMES'DAY: see DOMESDAY. EXETER-ELM, n. in bot. *Ulmus Montana*. EXETER-OAK, n. in bot. *Quercus cerris*.

EXETER HALL: large proprietary building, on the n. side of the Strand, London; 131 ft. long, 76 ft. wide, and 45 ft. high. It was completed 1831, and can contain more than 3,000 persons. It is let chiefly for religious assemblies, and is in great request during the 'May Meetings' of the several religious societies. It is also let as a concert-room, and has been the scene of many great musical fêtes.

EX FACIE, phrase, *ěks fŭ'shĭ-ē* [L.]: from the face of; applied to what appears on the face of a document or writing.

EXFOLIATE, v. *ěks-fŏ'li-āt* [mid. L. *exfoliātus*, stripped of leaves—from L. *ex*, out of; *folĭum*, a leaf: F. *exfolier*]: to come off in scales; to scale off. EXFO'LIATING, imp. EXFO'LIATED, pp. EXFO'LIATION, n. -*ā'shŭn* [F.—L.]: the process of separation in scales or splinters. EXFO'LIATIVE, a. -*ā-tĭv*, having the power of causing exfoliation.

EXHALE, v. *ěgz-hāl'* [F. *exhaler*—from L. *exhalārē*, to

EXHAUST—EXHIBIT.

breathe out—from *ex*, out of; *hālō*, I breathe: It. *esalare*]: to send out, as vapor or fume; to breathe out; to evaporate. EXHA'LING, imp. EXHALED', pp. -hāld'. EXHALATION, n. *eks'hā-lā'shūn* [F.—L.]: the act or process of sending forth in fume or vapor—generally applied to what rises in the form of vapor from the earth; that which is emitted; effluvia. EXHALABLE, a. *ēgz-hā'li-bl*, capable of being evaporated. EXHALANT, a. *ēgz-hā'lānt*, having the quality of evaporating or breathing out.

EXHAUST, v. *ēgz-awst'* [L. *exhaustus*, emptied by drawing—from *ex*, out of; *haustus*, drained, emptied]: to empty by drawing out; to use and expend the whole; to fatigue very much. EXHAUST'ING, imp.: ADJ. wholly or partially depriving of a quality or power, as strength. EXHAUSTED, pp. EXHAUST'ER, n. one who. EXHAUST'IBLE, a. -tī-bl, that may be exhausted. EXHAUST'ION, n. -hawst'yūn [F.—L.]: the act of drawing out or emptying; state of being emptied; state of being deprived of strength or spirits, in which the vital powers act feebly. EXHAUS'TIVE, a. -hawst'tiv, tending to deprive of power, strength, or quality; that has treated the subject fully and from every point of view. EXHAUST'LESS, a. that cannot be exhausted. METHOD OF EXHAUSTIONS, mode of proving mathematical propositions regarding quantities by continually taking away parts of them. The method was frequently employed by the ancient geometers; its fundamental maxim, as stated by Euclid, being that those quantities are equal whose difference is less than any assignable quantity. Euclid employs the method in Book x. Prop. 1; and it was used by Archimedes to prove that the area of a circle is equal to that of a right-angled triangle whose one leg adjoining the right angle is the radius, and the other the circumference. In this ancient method is seen the rudimentary form of the modern transcendental analysis —SYN. of 'exhaust': to drain; consume; spend; weary; tire out; empty; expend; wear out; excite.

EXHAUSTION OF SOILS: see MANURE: SOILS.

EX'HEDRA: same as EXEDRA.

EXHIBIT, v. *ēgz-hīb'it* [L. *exhibītus*, shown or displayed—from *ex*, out of; *hībēō*, I have or hold: F. *exhiber*]: to present to view; to offer for inspection; to display; to show; to administer as a medicine: N. any paper formally exhibited in a court of law. EXHIB'ITING, imp. EXHIB'ITED, pp. EXHIB'ITANT, n. -ant, in law, one who makes an exhibit. EXHIB'ITOR, n. -ī-tēr, one who exhibits; also EXHIB'ITER, n. -tēr. EXHIBITION, n. *eks'hī-bīsh'ūn* [F.—L.]: a showing or presenting for inspection; any public show; display; that part of the income of a school or college applied for the maintenance of scholars at English universities—in Scot., called a *bursary*; an annual prize of money. EX'HIBITIONER, n. a student who enjoys an exhibition. EXHIBITIVE, a. *ēgz-hīb'i-tiv*, representative. EXHIB'ITIVELY, ad. -lī. EXHIB'ITORY, a. -ī-ter-ī, showing; displaying. EXHIB'IT, n. any article displayed to view, as in a cattle-show or industrial exhibition; a law term, as in 'havers and

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exhibits, signifying documents exhibited by a witness before a legal tribunal: see **HAVERS**. **ART EXHIBITION:** see **ART EXHIBITION**.

EXHIBITION, INDUSTRIAL [Fr. *Exposition de l'Industrie*]: displays, usually international, of the products of labor. The first was in France, 1798, at the suggestion of the Marquis d'Avèze. It was held in the Maison d'Orsay and its grounds; but it appears to have been rather a collection of such objects of French art-manufacture as could be borrowed from their owners, than an assembling together of competing artists and manufacturers with their respective works. In the same year, another exhibition was held in Paris, on a grander scale, and with considerable success. It embraced all kinds of manufactures; hence has been claimed, but not justly, as the first of industrial exhibitions. Another was held 1802, under the consulate of Napoleon; and these successes led to the establishment of triennial exhibitions.

In Britain, 1850, the Prince Consort originated the plan of holding a universal exhibition open to all comers. Previously, however, the Royal Dublin Soc., since 1829, had had triennial exhibitions of native industry.

In England, the first well-organized exhibitions were those of the Cornish Polytechnic Soc., illustrating the mineral wealth of the county, and its mechanical appliances for mining. These were annual until 1850. Manchester, Birmingham, and Liverpool also held local exhibitions; that of Birmingham, 1849, far the most important, was the prototype of the 1851 exhibition.

For the great Exhibition in London, 1851, proposed by Prince Albert, the subscription list to a guarantee-fund was opened by the queen with £1,000. The exhibition took place in a vast structure of iron and glass, called the Crystal Palace, in Hyde Park, London. The edifice, planned by Sir Joseph Paxton (q.v.), was opened by her majesty, 1851, May 1. It was 1851 ft. long by 456 ft. broad, and 66 ft. high; area 13 acres. On the ground floor and galleries were 8 m. of tables. The glass in the structure weighed more than 400 tons. The number of exhibitors exceeded 17,000. The exhibition was open 144 days, closed Oct. 11. The entire number of visitors was 6,170,000, averaging 43,536 per day. The largest number at one time in the building was 109,760, Oct. 8. The entire money drawn for tickets of admission amounted to £505,107; and after all expenses were defrayed, a balance of £150,000 was left over; so that there was no call on those who subscribed the guarantee fund. Popularly, this great exhibition was called the World's Fair, for it drew visitors from all parts of the world. When the exhibition was over, the building was cleared away. In 1852, an exhibition (domestic) was held in Cork, Ireland; in 1853, one in Dublin (international) including a fine gallery of pictures; in the same year, one in New York (international) in a building of glass and iron called the Crystal Palace, on Reservoir Square, Sixth Ave. and 42d St. France, 1855, repeated the experiment with immense success; both the industrial and the art collections

EXHIBITION.

were such as the world had never seen before. Though wanting the imposing magnitude of the Hyde Park building, the contents of the Palais de l'Industrie, with its detached Picture-gallery and its Annexe, were of the choicest description, and reflected the highest credit on French taste and skill. Several other continental nations followed with various success, and now every country looks upon an exhibition of its industrial resources and productions, from time to time, as a grand necessity. In 1861, there was an exhibition at Haarlem, in which a vast assemblage of admirably arranged specimens illustrated every industry followed by the most industrious and methodical people of Europe.

Among the more important international exhibitions held since the Centennial Exhibition (q.v.) in Philadelphia 1876, are those at Paris 1878; Berlin and Sydney 1879; Melbourne 1880; Berlin, Moscow, and Buenos Ayres 1882; Louisville, Caracas, Amsterdam, and Chicago (railroad appliances) 1883; Calcutta and New Orleans (cotton) 1884; Antwerp 1885; Edinburgh and Liverpool (shipping) 1886; Manchester 1887; Melbourne (centennial), Glasgow, and Brussels 1888; Boston (maritime) and Paris 1889; and in London (electrical) 1882, (fisheries) 1883, (health) 1884, (inventions) 1885, (colonial) 1886, (American) 1887, (Italian, Irish, and Anglo-Danish) 1888, and (Spanish) 1889. As completing a series of commemorations of the 400th anniversary of the discovery of America by Columbus, the Columbian World's Exposition (q.v.) under the auspices of the U. S. govt. was held at the city of Chicago on a scale of unprecedented grandeur.

The universal exhibition at Paris 1889, commemorating the centennial of the fall of the Bastille, excelled all its predecessors in magnitude and comprehensiveness. It was organized and conducted conjointly by the govt., the city of Paris, and an association of guarantors, the govt. agreeing to advance \$3,400,000, the city \$1,600,000, and the association \$3,600,000, total \$8,600,000. Of this total, \$6,330,000 were apportioned for the erection of the various buildings, and for improving the parks, gardens, etc., \$670,000 for the expenses of administration, and \$1,000,000 for working expenses, \$600,000 being set aside for use in case of emergency. With the included grounds, the exhibition occupied 173 acres. The Eiffel Tower (q.v.) was one of the principal attractions, and as a marvel of constructive skill was rivalled by the Machinery Palace, which had a span of 377 ft., and was without pillars or other similar support. The exhibition was opened May 5 and closed November 6, and during this period 28,000,000 persons passed its turnstiles, 111,000 on the opening day, 500,000 on the closing. The following estimates were made of visitors from various countries: Great Britain 600,000; United States and Canada 125,000; Belgium 118,649; Germany, 27,516; Holland 11,365; Russia 2,006; and so on down to Oceanica, credited with 500. The total receipts were \$9,800,000 and expenditures \$8,200,000. The octroi of Paris received

EXHILARATE—EXIGENT.

January—October 28 an increase of \$1,800,000 in duties collected over the like period 1888, and the city of Paris received \$540,000 from the profits of the exhibition. More than 60,000 persons exhibited wares of some kind, and 32,468 of them were rewarded by the juries as follows: grand prize 903, gold medal 5,153, silver medal 9,690, bronze medal 9,325, and honorable mention 8,070. The share of the United States in the exhibition was unsatisfactory alike to its citizens and those of other countries. Congress appropriated only \$250,000 to its commissioners, and the U. S. exhibits occupied the fourth rank in size. But in one respect the United States surpassed all other nations: its electrical display was exceeded in popular interest only by the Eiffel Tower. The site of the exhibition was, as in 1867, the Champ de Mars, to which was added the Esplanade des Invalides. The Pont d'Iena connected the Champ de Mars with the grounds of the Trôcadéro Palace, and was doubled in width for the occasion. Looking from this bridge toward the Ecole Militaire, the eye was attracted first by the row of 39 buildings designed and erected by Charles Garnier, the architect and archæologist, to reproduce the typical homes of the human race in all the past ages. Immediately beyond this group was the Eiffel Tower, surrounded by small ornamental lakes and specimens of the architecture of various S. American republics. The exhibition was a large financial success.

EXHILARATE, v. *ĕgz-hīl'ēr-āt* [L. *exhīlārātus*, gladdened greatly—from *ex*, out of; *hīlārātus*, cheered]: to cheer; to gladden; to make cheerful; to enliven; to become joyous. **EXHIL'ARATING**, imp.: **ADJ.** having the power or tendency to exhilarate. **EXHIL'ARATED**, pp. **EXHIL'ARA'TION**, n. *-ā shūn*, joyousness, gayety; the act of making glad or cheerful. **EXHIL'ARA'TINGLY**, ad. *-lī*. **EXHIL'ARANT**, a. exciting joy, mirth or pleasure: **N.** that which exhilarates.—**SYN.** of 'exhilarate': to animate; encourage; enliven; comfort; console; solace;—of 'exhilaration': animation; gladness; joyfulness.

EXHORT, v. *ĕgz-hōrt'* [F. *exhorter*—from L. *exhortor*, I encourage—from *ex*, out of; *hortor*, I advise, I instigate]: to advise; to warn or caution; to animate or incite by words. **EXHORT'ING**, imp. **EXHORT'ED**, pp. **EXHORTATION**, n. *ĕkz'hōr-tā'shūn* [F.—L.]: the act of exhorting; incitement to laudable deeds; formal advice; counsel. **EXHOR'TATIVE**, a. *ĕgz-hōr'tī-tīv*, containing exhortation. **EXHOR'TATORY**, a. *-tēr-ī*, tending to exhort. **EXHOR'TER**, n. one who.

EXHUME, v. *ĕks-hūm'* [F. *exhumer*, to unbury—from mid. L. *exhūmārē*—from L. *ex*, out of; *hūmus*, the ground]: to dig up what has been buried; to disinter. **EXHU'MING**, imp. **EXHUMED'**, pp. *-hūmd'*. **EX'HUMA'TION**, n. *-hū-mā'shūn* [F.—L.]: the act of disinterring; the digging up of anything buried.

EXIGENT, a. *ĕks'ĭ-jĕnt* [L. *exigens* or *exigen'tem*, driving or thrusting out—from *ex*, out of; *agens*, doing or driving]: pressing; urgent; requiring immediate aid or action.

EXIGUITY—EX LEGE.

EX'IGENCE, n. -jěns, or **EX'IGENCY**, n. -jěn-sǐ, urgent need or want; pressing necessity. **EX'IGIBLE**, a. -jǐ-bl, capable of being demanded.—**SYN.** of 'exigency': emergency; crisis; conjuncture; demand; urgency; pressure; distress; necessity.

EXIGUITY, n. ěks'ì gǔ'ì-tǐ [F. *exiguité*, scantiness—from *exigu*, scanty—from L. *exiguus*, scanty, small]: smallness; slenderness. **EXIG'UOUS**, a. -ǔ-ús, small; scanty.

EXILE, n. ěgz'íl or ěks'íl [F. *exil*, banishment; *exile*, the person banished—from L. *exilium*, banishment—from *exul*, an exile]: the state of being expelled from one's native country; banishment, sometimes voluntary; the person expelled from his native country; one who leaves his own to reside in another country; one separated from friends or country by necessity: **V.** to drive away or banish from one's native country by misfortune or necessity. **EXI'LING**, imp. **EXILED**, pp. ěgz'ıld or ěg-zıld'. **EXILIC**, a. ěgs'íl-ík, relating to or connected with exile or banishment: *specifically*, relating to the captivity of the Hebrews in Babylon.—**SYN.** of 'exile, v.': to banish; expel; transport; proscribe; drive away.

EXILITY, n. ěks-ǔ'ì-tǐ [L. *exilis*, thin, slender]: slenderness; smallness.

EXINANITION, n. ěks'ín-ǎ-nǐsh'ǎn [L. *ex*, out of, *inanis*, empty, void]: in *OE.*, emptiness; loss; privation.

EXINDUSIATE, a. ěks-ín-dǔ-zǐ-āt: in *bot.*, not having an indusium; used chiefly of ferns.

EXINTINE, n. ěgz-ín'tín [L. *ex*, from; *intus*, within]: in *bot.*, one of the inner coverings of the pollen-grain: see **EXTINE**.

EXIST, v. ěgz-íst' [F. *exister*, to exist—from L. *existere*: L. *existens*, being visible, existing: It. *existere*]: to be; to have an essence or real being; to live; to endure. **EXIS'TING**, imp.: **ADJ.** having being or life; actual. **EXIS'TED**, pp. **EXIS'TENCE**, n. -is'těns [F.—L.]: real being or essence; life; animation. **EXIS'TENT**, a. having being.—**SYN.** of 'exist': to subsist; occur; continue.

EXIT, n. ěks'ít [L. *exit*, he goes out—from *exire*, to go out—from *ex*, *ire*, to go]: the departure of a player from the stage; a word placed on the margin of a play to indicate the same; the act of quitting the stage of life; death; a departure; a passage out of any place; a way. **EXITUS**, n. -tǔs, in *law*, issue, offspring; yearly rents or profits of land. **EX'EUNT**, plu. -ě-ünt [L.]; they go out. **EX'EUNT OMNES**, ǒm'něz [L. *exěunt*, they go out; *omnēs*, all]: they all go out.

EXITELE: same as **EXITELITE**.

EXITELITE, n. ěks'ì-těl-ít [F. *exitèle*—from Gr. *exitēlos*, going out, disappearing, fading]: in *mineral.*, the same as Valentinite (q.v.).

EX LEGE, phrase, ěks lějě [L. out of the law]: arising from law.

EX MERO MOTU—EXMOUTH.

EX MERO MOTU, phrase, *eks mēr'ō mō'tū* [L.]: of one's own motion.

EXMOOR FOREST, *eks'môr*: moory, mostly uncultivated waste, consisting of dark ranges of hills and lonely valleys, 14 sq. m. in area, in the w. of Somersetshire and n.e. of Devonshire. It is bordered by deep wooded glens. The hills rise in Dunkery Beacon to 1,668 ft., in Chapman Barrow to 1,540, and in Span Head to 1,510. Devonian slates, with some new red sandstone in the n. form the substratum. It is covered with heath, interspersed with juniper, cranberry, and whortleberry, with much meadow-land. Throughout this tract there is a native breed of ponies, known as Exmoor ponies, reputed stout and hardy. Since 1851, E. has become an iron-mining district. The river Exe, and its tributary the Barle, rise in Exmoor. The region is subject to winds and mists.

EXMOUTH, *eks'müth*: town in the e. of Devonshire, on the left bank of the mouth of the Exe, 10 m. s.e. of Exeter; at the base and on the slope and top of a hill rising from the sandy estuary of the Exe. It is noted for its mild climate. From about 1700, it was the chief watering-place on the Devon coast, till the rise of Torquay. There is a fine promenade on a sea-wall 18 ft. high. The Woodbury Hills on the e. 800 ft. high, protect it from the e. winds. Here Sueno the Dane landed 1003. It was taken by the royalists 1646.—Pop. (1871) 5,614; (1881) 6,245; (1891) 8,097.

EXMOUTH, *eks'müth*, EDWARD PELLEW, Viscount: 1757, Apr. 19—1833, Jan. 23; b. Dover, England: naval commander. He entered the British navy when 13 years of age, and first attracted notice by his gallant conduct in the battle on Lake Champlain, 1776, Oct. 11. In 1782, he attained the rank of post-captain. In 1793, in command of the *Nymphe*, frigate of 36 guns, he captured *La Cleopatre*, French frigate, which carried the same number of guns. For this victory he was knighted. In 1799, he received the command of the *Impétueux*, 78 guns, and was sent to the French coast, where many of his most brilliant actions took place. In 1804, Sir E. Pellew was advanced to the rank of rear-admiral of the red; in 1808, to that of vice-admiral of the blue; and in 1814, he was raised to the peerage, with the title of Baron Exmouth of Canonteign, Devonshire, with a pension of £2,000 a year. In 1816, he was sent to Algiers, to enforce the terms of a treaty regarding the abolition of Christian slavery, which the dey of Algiers had violated. With a combined fleet of 25 English and Dutch vessels, he bombarded the city for seven hours, and inflicted such immense damage, destroying all the Algerine fleet and many of the public buildings, that the dey consented to every demand. E., who had been wounded in the leg and cheek in this action, received on his return to England the thanks of both houses of parliament, and was promoted to the rank of viscount, 1816, Dec. 10. In 1821, he retired from public service, loaded with honors.

EX NECESSITATE—EXODUS.

EX NECESSITATE, phrase, *ěks nĕ-sĕs-ĭ-tā'tē* [L.]: of or from necessity; from the necessity of the case.

EXO, *ěks'ō* or *ĕgz'ō* [Gr.]: a Greek prefix, signifying 'on the outside.'

EXOCCIPITAL, n. *ěks-ōk-sĭp'ĭ-tal* [L. *ex*, out; Eng. *occipital*]: in *anat.*, condyloid portions of the occipital bone; in *comp. anat.*, the lateral parts of the first cranial segment, corresponding with the order of the *foramen magnum* in man.'

EXOCÆTUS, n. *ěks-ō-sē'tūs* [L. *exocætus*; Gr. *exōkoitos*; as adj., sleeping out; as n. a fish that comes upon the beach to sleep; *exō*, without; *koitos*, a bed, sleep]: in *ich.*, genus of *Scomberesocidae*; the body is moderately compressed, with large pectoral fins, the rays of which are stout and firm; the arm-bone or radius of this fin also is large. *Exocætus exiliens* is the Greater Flying-fish.

EXOCULATION, n. *ěks-ōk-ŭ-lŭ'shŭn* [L. *ex*, out of; *oculus*, an eye]: the act of putting out an eye.

EXOCE-TUS: see FLYING-FISH.

EXODIC, a. *ěks-ōd'ik*: in *phys.*, conducting influence from the spinal marrow. Used specially of the motor nerves.

EXODIUM, n. *ěks-ō'dĭ-ŭm* [L.—from Gr. *exodion*]: afterpiece in a theatre, usually played after tragedies; a farce.

EXODUS, n. *ěks'ō-dŭs* [Gr. *ex*, out of; *hodos*, a way]: the second book of the Old Testament; departure of the Israelites from Egypt; a departure from a place.—Exodus, the second book of the Pentateuch, may be regarded as composed of two parts—the first historical, and the second legislative. The historical part extends to the end of ch. xviii. It embraces a narrative of the various preparations, natural and supernatural, under the providence of God for the deliverance of the Israelites from their bondage in Egypt, and describes the accomplishment of their deliverance, and the journeyings of the people in the wilderness as far as Mount Sinai. The legislative part is devoted to a minute and elaborate account of the institution of the theocracy. The book presents three aspects of Hebrew history. We have, first, a picture of a people enslaved; second, of a people redeemed from bondage; and third, of a people sanctified and set apart to the service of God. The period embraced by the history of the book is usually reckoned at 142 or 145 years, which number is obtained as follows: From the death of Joseph to the birth of Moses, 60 or 63 years; from the birth of Moses to the departure from Egypt, 80 years; and from the departure out of Egypt to the erection of the tabernacle, 1 year. It cannot be denied, however, without wildly violating all the ordinary laws of the increase of population, that this is much too short a period to account for the existence of such a number of Hebrews as left Egypt—viz., 600,000, exclusive of women and children—i.e., in all, at least 2,500,000. Those who went down into Egypt with Jacob were 'three-

EXODUS.

score and ten souls,' and in 215 years, these, though prohibited from intermarrying with the Egyptians, had amounted to between two and three millions. The writer of Exodus, indeed, says (chapter xii., verse 40) that 'the sojourning of the children of Israel, who dwelt in Egypt, was 430 years,' adding that they left the land 'even the selfsame day' on which they had entered it. This statement, however, does not seem to harmonize with the author's previous narrative, and is certainly inconsistent with the language of the apostle Paul, who says (Gal. iii. 17) that the law was given 430 years after the covenant with Abraham, which took place about 215 years before Jacob and his sons went down into Egypt, so that, according to this view, the Israelites could only have been in Egypt 215 years. This is the number commonly accepted, but it is not wonderful that some writers should affirm, that 'it would be more satisfactory if we could allow 430 years for the increase of the nation in Egypt rather than any shorter period.' A still longer period would undoubtedly afford additional satisfaction; and Bunsen, in his *Ägypten's Stelle in der Weltgeschichte*, endeavors to show that the Israelites were in Egypt for *fourteen* centuries instead of two, and that the number 215 only indicates the period of oppression, the time when they were 'evilly entreated.' This conclusion is, of course, arrived at by the application of principles of criticism not generally recognized in the schools of British theology: but there seems no avoiding the conclusion, that the usual chronology is wrong.

May it not be that the interval which elapsed between the death of 'Joseph and all his brethren, and all that generation' (Ex. i. 6), and the period when there arose up a new king over Egypt which knew not Joseph (Ex. i. 8), was much longer than we suppose? The passage itself in Exodus seems to favor this idea; for the intervening verse (Ex. i. 7) speaks of the children of Israel 'increasing and multiplying, and waxing exceeding mighty, and filling the land,' without any reference at all to the time occupied in this process; and such words are certainly more applicable to a series of centuries than of years, while centuries, besides, would harmonize better than years with the statement that the Egyptian king knew not (i. e., had forgotten all about) Joseph. The only grave objection to this otherwise extremely probable hypothesis, is its incompatibility with the statement of St. Paul; and perhaps, as in a like case, Luther said of the inspired Stephen, 'he was no historian, and did not trouble himself about particulars.'

In explanation of the chronological difficulty, the confusion resulting from the use of *letters* as numerals in Hebrew mss. has been urged; and this is notoriously a fertile source of error and contradiction, which rationalistic critics have not sufficiently kept in mind. To adduce such a reason, however, would be unavailing in the present case; for if it could be proved that the period stated in Exodus may have been abbreviated through the negligence of some careless transcriber, or otherwise, and thus an ap-

EX OFFICIO—EXOGEN.

proximation be made to the *fourteen* centuries of Bunsen, this would only place the writer of the Pentateuch in more visible antagonism with St. Paul himself. The date of the exodus is fixed by Usher at B.C. 1491: by the Septuagint, at B.C. 1614; by Hales, at B.C. 1648; by Wilkinson, about B.C. 1495, in the reign of Thothmes III.; and by Bunsen, as late as B.C. 1320 or 1314, in the reign of Menephtah, in the latter of which years Manetho gives what appears to be the Egyptian version of the event. The genuineness and authenticity of the book of E. have been sharply criticised in modern times. The chronology is confused; but recent investigations indicate, as the probable date of the Exodus from Egypt, B.C. 1317, Apr. 15. Among the theologians who have questioned the integrity of E. are Von Lengerke, Stähelin, De Wette, Knobel, and Colenso, who find traces of an older and a later author, the former of whom they call Elohist, and the latter Jehovistic. Their objections have been replied to by Hengstenberg and many others, who contend that the distinction is either artificial, or incapable of precise application. See PENTATEUCH: MOSES: JEWS.

EX OFFICIO: see under Ex.

EXOAMY, n. *ěks-ög'ä-mě* [Gr. *exō*, without; *gamos*, marriage]: the practice among certain savage peoples of always marrying out of the tribe (see TRIBE). EXOAMOUS, a. *ěks-ög'ä-mūs*, pertaining to a tribal law among savages of always marrying from another tribe.

EXOGASTRITIS, n. *ěks-ō-gās-trī'tis* [prefix *exo-*; Eng. *gastritis*]: in *pathol.*, inflammation of the external membrane of the stomach.

EXOGEN, n. *ěks'ō-jěn*, EX'OGENS, n. plu. *jěns* [Gr. *exo*, without; *gennāō*, I produce]: that division of the vegetable kingdom in which the plants grow by additions to the outside of the wood in the form of annual concentric layers, as in the oak, ash, elm, and other dicotyledons—distinguished from the *endogens*, those plants whose growth is from within outward. EXOGENOUS, a. *-ě-nūs*, growing or increasing in size by annual additions to the outside, as in the oak, ash, etc.; in *anat.*, growing out from a bone already formed.—*Exogenous plants* are those in which the woody substance of stem increases by bundles of vascular tissue added externally. The exogenous stem contains a central *Pith* (q.v.), from which *medullary rays* proceed to the Bark (q.v.) and the bark is easily separable from the woody part (see WOOD) which it surrounds. The exogenous is thus very different in structure and manner of growth from the endogenous or the acrogenous stem. Amid the cellular substance of the young stem, when it has developed itself from the seed, woody cords are seen connecting the cotyledons, and afterward the leaves, when these appear, with the root, in the central axis of which they join. A section of the stem exhibits the cellular substance traversed by vascular bundles (wood and bast), which in the section are more or less wedge-shaped, radiating from the centre, but not prolonged into the centre

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itself, which, even to the greatest age of the stem, remains occupied by the cellular pith. Additional bundles are interposed, as growth proceeds, diminishing the proportion of cellular substance in the stem, yet without these bundles ever becoming so compacted together as to cut off the communication between the cellular centre of the stem and its bark, which is maintained by means of the medullary rays, often, indeed, imperceptible to the naked eye, but always present even in the hardest and most close-grained wood. The woody layers which are formed in successive years, as new leaves and branches are developed, are formed amid the *Cambium* (q.v.), into which the woody fibres of the new leaves descend, between the bark and the former wood. Thus the concentric circles are formed, usually one for each year's growth, distinguishable even in the most matured timber, and by which the age of trees is commonly computed. The beginning of each new layer is generally marked by a greater abundance of *pitted vessels*, the openings of which are conspicuous in the transverse section. In pines, the line of separation between the layers is marked by greater density of texture, and often by deeper color. The age of trees cannot, however, be calculated with perfect certainty from the concentric circles of the stem, as any circumstance which temporarily arrests the growth in any summer, may produce an effect similar to that ordinarily produced by the change of seasons; while in the trees of tropical countries, at least where the wet and dry seasons are not very marked, concentric circles are often not to be discovered.

The structure of the branch of an exogenous tree perfectly corresponds with that of the stem. The vascular bundles of the stem or branch form a loop where a leaf begins, and those of the leaf and its axillary bud spring from the loop. The roots of the exogenous plants have not a central pith like the stem, but in a few trees, as the horse-chestnut the pith is prolonged to some extent into the root.

Anomalies are frequently seen in the structure of exogenous stems, particularly among the twining woody plants of tropical countries. There are also very many herbaceous plants, in which, though the structure agrees with that of an exogenous tree in its first year, no further development is ever attained; while in many, even this is very imperfectly reached; yet these are on other accounts unhesitatingly classed with exogenous plants. The exogenous stem and dicotyledonous seed are so constantly found together; and the term *exogenous*, designating a great division of the vegetable kingdom, is now giving place to the term *dicotyledonous* (q.v.): see BOTANY. Exogenous plants are also characterized by a particular mode of germination, with reference to which they are called *exorhizal* [Gr. *exō*, outward; *rhiza*, a root], the radical simply lengthening, and not having to break through the coat of the embryo. The leaves of exogenous plants generally exhibit a network of veins, instead of the parallel veins characteristic of endogens, and a greater proportional breadth of leaf usually accompanies this reticulated venation.

EXOGENIUM—EXOPHYLLOUS.

Exogenous plants are far more numerous than **endogenous**. The trees and shrubs of temperate and cold climates generally, are **exogenous**, as well as very many herbaceous plants of these parts of the world, and many trees, shrubs, and herbaceous plants of the tropics. Almost all trees, except palms and a few *Liliaceæ*, *Pandanaceæ*, and tree-ferns, are **exogenous**.

EXOGENIUM, n. *ěks-o-gō'nĭ-ŭm* [Gr. *exo*, outside; *gonē*, that which engenders, because the stamens are exserted]: genus of *Convolvulaceæ*, tribe *Convolvuleæ*. *Exogonium Purga*, a beautiful twiner, with long purple flowers, furnishes the best jalap.

EXOGYRA, n. *ěks-o-jĭr'a* [Gr. *exō*, outside; *gyros*, a ring, a circle: so named because the beaks are reversed, that is, turned to the posterior side of the shell]: in *paleon.*, subgenus of *Gryphæa*. Known species 46, ranging from the Oolite to the Chalk. They are found in the rocks of the United States and Europe.

EXOMPHALOS, n. *ěks-ŏm'fŭ-lŏs* [Gr. *exō*, without; *omphālos*, a navel]: umbilical hernia; the protrusion of the intestine through the umbilicus.

EXON, n. *ěks'ŏn*: an officer of the yeomen of the royal guard in England. **EXONSHIP**, n. *-ship*, the office or post of an **exon** of the royal body-guard. **EXON-IN-WAITING**, an officer of the royal guard in special attendance on the court.

EXON, a.: pertaining to Exeter cathedral or city.

EXONERATE, v. *ěgz-ŏn'ēr-āt* [L. *exōnērātus*, freed from a burden—from *ex*, out of; *onērātus*, loaded; *onus*, a load: It. *esonerare*: F. *exonérer*]: to free from; to clear from blame; to cast off, as an obligation or charge on any one; to exculpate; to absolve. **EXON'ERATING**, imp. **EXON'ERATED**, pp. **EXON'ERA'TION**, n. *-ā'shŭn*, the act of freeing from a charge or from blame. **EXONERATOR**, n. *-tēr*, one who exonerates another. **EXON'ERATIVE**, a. *-tĭv*, freeing from an obligation or from blame.—**SYN.** of 'exonerate': to acquit; clear; justify; discharge; unload; disburden; relieve.

EXOPHAGY, n. *ěks-ŏf'a-jĭ* [Gr. *exō*, without, externally; *phagein*, to eat]: kind of cannibalism in which only persons of a different tribe are eaten. **EXOPH'AGOUS**, a. *-gŭs*, practicing **exophagy**.

EXOPHLÆUM, n. *ěks-o-flē'ŭm* [Gr. *exō*, outside; *phloios*, kind or bark of trees]: in *bot.*, same as **EPIPHLÆUM**.

EXOPHTHALMOS, n. *ěks'ŏf thāl'mŏs*, or **EX'OPHTHAL'MIA**, n. *-thāl'mĭ-ā* [Gr. *exō*, without, outside; *ophthal'mos*, the eye]: great prominence of the eyes, in which the individual has a marked and peculiar stare. **EX'OPHTHAL'MIC**, a. *-thāl'mĭk*, of or pertaining to **exophthalmia**. **EXOPHTHALMIC-GOITRE**, n. in *med.*, an indolent tumor on the fore part of the neck, caused by enlargement of the thyroid gland, and attended by protrusion of the eyeballs, *anæmia*, and palpitation.

EXOPHYLLOUS, a. *ěks-ŏf'ĭl-ŭs* [Gr. *exō*, outside; *phyl-lon*, a leaf]: not evolved from a sheath, but outside all such

EXOPODITE—EXORCISE.

protection; used of dicotyledons as distinguished from monocotyledons, the leaves of which are evolved from a sheath.

EXOPODITE, *n.* *ěks-ŏp'ŏ-dīt* [Gr. *exō*, outside; *pous* or *poda*, a foot]: in *zool.*, the outer of the two secondary joints into which the typical limb of a crustacean is divided.

EXOPTILES, *n.* *ěks-ŏp'til* [Gr. *exō*, outside; *ptilon*, feather, leaf, because the plumula is naked]: in *bot.*, name given by Lestibondo to *Dicotyledons*.

EXORBITANT, *a.* *ěgz-ŏr'bī-tānt* [F. *exorbitant*, *exorbitant*—from mid. L. *exorbitān'tem*—from L. *ex*, out of; *orbītā*, the track of a wheel, the impression of anything—from *orbis*, an orb or sphere]: deviating from the usual course; unreasonable; enormous; excessive. **EXORBITANCE**, *n.* *-tāns*, or **EXORBITANCY**, *n.* *-tān-sī*, a going beyond due limits; enormity; excessive extravagance. **EXORBITANTLY**, *ad.* *-lī*.

EXORCISE, *v.* *ěks'ŏr-sīz* [F. *exorciser*—from mid. L. *exŏrcizārē*—from Gr. *exŏrkizein*, to cause to swear, to conjure—from *ex*, intensive; *orkizein*, to bind by oath—from *orkos*, an oath]: to expel evil spirits by prayers and ceremonies, or by conjurations; to deliver from evil spirits; to adjure by a holy name. **EXORCISING**, *imp.* **EXORCISED**, *pp.* *-sīzd*. **EXORCISER**, *n.* *-sī-zēr*, one who pretends to be able to cast out evil spirits. **EXORCIST**, *n.* *-sīst*, one who. **EXORCISM**, *n.* *-sīzm*, the act of exorcising; conjuration in the name of the heavenly powers; term used by the Fathers of the church to denote the act of conjuring evil spirits, in the name of God or Christ, to depart out of the person possessed. The first Christians adjured evil spirits in the name of Jesus Christ, who had conquered the devil; but as the opinion was at the same time entertained, that all idolaters belonged to the kingdom of Satan—who suffered himself to be worshipped under the form of idols—it was customary to exorcise heathens previous to their receiving Christian baptism. After Augustine's theory of original sin had found acceptance in the 5th c., and all infants were regarded as belonging to Satan's kingdom, exorcism became general at the baptism even of Christian children. Following the practice of the Rom. Cath. Church, Luther retained exorcism, but it was laid aside by the Reformed Church. Although abandoned by illustrious and orthodox Prot. theologians, such as Chemnitz and Gerhard, or deemed unessential, and in modern times discarded by the 'Protestant' Church, the practice has been recently revived by the Old Lutheran or High-Church party.

In the Rom. Cath. Church, the function of exorcism belongs peculiarly to one of the so-called 'minor orders': see **ORDERS**. Our Lord having not only himself in person (Matt. ix. 32; Mk. i. 25; Lk. iv. 35; viii. 29) cast out devils, but having also given the same power to his disciples, it is believed to be permanent in the church. Of its exercise in the early church, both in relation to 'energumens,' or persons possessed, and in the administration of baptism, there are numerous examples. Tertullian and Origen speak of it as of ordinary occurrence, and the council of Carthage, 255, al-

EXORDIUM—EXOSSATE.

ludes to its use in baptism. The rite of exorcism is used by the modern church in three different cases: in the case of actual or supposed demoniacal possession in the administration of baptism, and in the blessing of the chrism or holy oil, and of holy water. Its use in cases of possession is now extremely rare, and in many diseases is prohibited, unless with the special permission of the bishop. In baptism it precedes the ceremony of applying the water and the baptismal form. It is used equally in infant and in adult baptism, and Rom. Cath. writers appeal to the earliest examples of the administration of the ordinance as evidence of the use of exorcism in both alike. The rite of baptismal exorcism in the Rom. Cath. Church follows closely the Scriptural model, Mk. viii. 33. The exorcisms in the blessing of the oil and water resemble very closely the baptismal form, but are more diffuse.

EXORDIUM, n. *эгз-ѳр'дѳ-ѳм* [L. *exordĭum*, the warp of a web, a beginning—from *ex*, *ordĭor*, I begin a web, I begin: It. *esordio*: F. *exorde*]: the introductory part of a discourse, or of a written composition; the opening part of an oration or speech. **EXOR'DIAL**, a. *-ѳл*, introductory.

EXORHIZAL, a. *ѳкс'ѳ-рѳ'зѳл* [Gr. *exō*, outside; *rhiza*, a root]: in *bot.*, applied to those plants whose roots in germination proceed at once from the radicular extremity of the embryo, and do not burst through an outer coat. **EXORHIZÆ**, n. *-зѳ*, in *bot.*, name given by Richard to what are commonly called Exogens. The term is used because in germination the radicles have no sheaths at their base, but appear at once. Richard termed them also *Synorhizeæ*. **EXORHIZOUS**, same as **EXORHIZAL**.

EXOSKELETON, n. *ѳкс'ѳ-скѳл'ѳ-тѳн* [Gr. *exō*, outside; *skēlēton*, a dry body or mummy]: in *anat.*, the hardened superficial tissues of external protection, as the crusts of crabs, the plates of reptiles, and the scales of fishes.

EXOSMOSE, n. *ѳкс'ѳс-мѳс* [Gr. *exō*, outside; *ōsmos*, a thrusting, an impulsion: F. *exosmose*]: the passing outward of a fluid through a membrane by diffusion—the passing inward from the outside is called *endosmose* (q.v.). **EX'OSMOT'IC**, a. *-мѳт'ѳк*, pertaining to. **EXOS'MIC**, a. *-мѳк*, same as **EXOSMOTIC**.

EXOSPORE, n. *ѳкс'ѳ-спѳр* [Gr. *exō*, without; *spora*, seed]: the outer covering or wall of a spore; that which may be compared to the extine of a pollen-grain. **EXOSPOROUS**, a. *ѳкс'ѳс'пѳ-рѳс*, having naked spores as in fungi.

EXOSSATE, a. *ѳкс'ѳс'sѳт*, or **EXOS'SATED**, a. *-ѳд* [L. *exossatus*]: deprived of bones.

EXOSTEMMA—EXPAND.

EXOSTEMMA, *ěks-o-stém'ma*: genus of American trees and shrubs of the nat. ord. *Cinchonaceæ*, nearly allied to *Cinchona*. Several species yield febrifugal barks, which, however, do not contain the chincona alkaloids. The most valued of these barks are Caribbee Bark (q.v.) and Saint Lucia Bark, the latter of which is the produce of *E. floribunda*, native of the more mountainous parts of the W. Indies.

EXOSTOME, n. *ěks'ôs-tôm* [Gr. *exō*, outside; *stoma*, a mouth]: in *bot.*, the outer opening of the foramen of the ovule.

EXOSTOSIS, n. *ěks'ôs-tô'sis* [Gr. *exostōsis*, a bony excrescence—from *ex*, out of; *ostēōn*, a bone: F. *exostose*]: in *nat.*, an unnatural projection or growth from a bone (see **UMOR**); in *bot.*, a wart-like excrescence.

EXOTERIC, a. *ěks'ô-tēr'ik*, or **EXOTER'ICAL**, a. *-i-kāl* [Gr. *exōterikos*, external; *exōtērōs*, exterior—from *exō*, outside: L. *exōtēricūs*: It. *esoterico*: F. *exotérique*]: public; external; opposed to *esoteric* or secret (see **ESOTERIC**); professed or taught openly. **EXOTER'ICISM**, n. *-sizm*, exoteric doctrines or principles. **EXOTER'ICS**, n. *-iks*, lectures of Aristotle on rhetoric, to which all were admitted.

EXOTHECIUM, n. *ěks'ô-thē'shî-ŭm* [Gr. *exō*, without; *thēkē*, a case or sheath]: in *bot.*, the outer coat of the anther.

EXOTIC, n. *ěgz-ô't'ik* [Gr. *exōtikōs*, foreign, strange—from *exō*, outside: L. *exōticūs*: F. *exotique*]: a plant, shrub, or tree introduced from a foreign country; something foreign: **ADJ.** foreign; not native; also **EXOT'ICAL**, a. *-i-kāl*. **EXOT'ICISM**, n. *-sizm*, state of being exotic. *Note.*—*Indigenous*, the opposite of *exotic*, means naturally belonging to a region.—*Exotics* or *Exotic plants* are usually those of which the native country differs so much in soil or climate from that into which they have been conveyed, that their cultivation is attended with difficulty, requiring artificial heat or other means different from those requisite in the case of indigenous plants. Some exotics seldom flower in their new home; and of those that flower, some never ripen their fruits and seeds.

EXPAND, v. *ěks-pānd'* [L. *expandere*, to spread out—from *ex*, out of; *pando*, I open or spread: It. *espandere*]: to open; to spread out or enlarge a surface; to extend; to dilate. **EXPAND'ING**, imp. **EXPAND'ED**, pp. **EXPANSE'**, n. *-pāns'* [L. *ex*, *pansūs*, spread]: a wide extent of space or body; extent; a spreading. **EXPAN'SIBLE**, a. *-ān'si-bl*, capable of being extended. **EXPAN'SIBLY**, ad. *-bli*. **EXPAN'SIBIL'ITY**, n. *-bil'i-ti*, capacity of extension in surface or bulk. **EXPAN'SION**, n. *-shūn* [F.—L.]: act of expanding; state of being expanded; the enlargement of the surface or size of a body; extension (see **HEAT**). **EXPAN'SIVE**, a. *-siv*, widely extended; having the power to dilate or spread out; having the capacity of being expanded. **EXPAN'SIVELY**, ad. *-siv-li*. **EXPAN'SIVENESS**, n.—**SYN.** of 'expand': to enlarge; distend; spread; diffuse.

EX PARTE—EXPECTATION.

EX PARTE, a. *ěks' pâr'tě* [see under **Ex**]: in *law*, executed by one side only; in *common conversation*, that which is related on one side only of the matter, as, an *ex parte* statement; one-sided.

EXPATiate, v. *ěks-pā'shĭ-āt* [*L. expātiātus*, extended, spread out—from *ex*, out of; *spātiōr*, I wander or walk about]: to enlarge on a subject in speech or writing; to be copious in discussion. **EXPA'tiATING**, imp. **EXPA'tiATED**, pp. **EXPA'tiA'tION**, n. *-ā'shŭn*, a wandering at large. **EXPA'tiATOR**, n. *-tēr*, one who. **EXPA'tiATORY**, a. *-ā-tēr-ĭ*

EXPATRIATE, *ěks-pā'trĭ-āt* [mid *L. expātriātus*, banished—from *L. ex*, out of; *pātriā*, one's country: *F. expatrier*, to banish]: to banish from one's native land. **EXPA'triATING**, imp. **EXPA'triATED**, pp. banished. **EXPA'triA'tION**, n. *-ā'shŭn*, banishment from one's native country, voluntary or otherwise, but understood usually as voluntary. Expatriation, in international law, is the principle by which an individual, the subject or citizen of one country, is allowed to adopt another citizenship or national character. It includes naturalization, which is the act of adopting a foreigner and clothing him with all the privileges of a native citizen or subject. Though at one time doubted and even denied by certain European authorities, the right of expatriation of every free person owing no debts, and guilty of no crime is now generally conceded. See **NATURALIZATION**.

EXPECT, v. *ěks-pěkt'* [*L. expēctārē*, to await, to expect—from *ex*, out of; *specto*, I look at. *It. aspettare*] to look out for; to wait for; to have an apprehension of something future; to entertain a belief that something will happen; to demand or require. **EXPEC'tING**, imp. waiting or looking for the arrival of. **EXPEC'tED**, pp.: **ADJ.** looked for; apprehended. **EXPEC'tANT**, n. *-pěkt'ānt* [*F.—L.*]: one possessed of the belief or hope that he will at some future time receive something good; **ADJ.** waiting; looking for. **EX'PECTA'tION**, n. *-tū'shŭn* [*F.—L.*]: the act of looking forward to; the state of expecting; the prospect of good to come; mean duration of life; value of a contingency (see **PROBABILITY**). **EXPECTATION WEEK**, week or period between Ascension Day and Pentecost Day, because during this time the apostles continued praying in earnest expectation of the Holy Spirit as promised. **EXPEC'tANCY**, n. *-tān sĭ*, something expected; a looking for with pleasure; also **EXPEC'tANCE**, n. *-tāns*. **EXPEC'tINGLY**, ad *-lĭ*. **EXPEC'tATIVE**, a. *-tĭ-tĭv* [*F.—L.*]: constituting an object of expectation. **EXPEC'tER**, n. one who.—**SYN.** of 'expect': to wait; await; anticipate; look for; hope; think; believe; trust.

EXPECTATION, in Medicine, treatment of disease without active remedies, by merely observing its progress and averting its consequences through physiological means; as, for instance, when a fracture (q.v.) is treated by keeping the ends of the broken bone in their proper place, until the natural processes of repair are completed. Expectation is in this and other cases obviously a quite different thing from

EXPECTORATE—EXPEND.

inaction, or the systematic doing of nothing with which it has been sometimes confounded.

EXPECTORATE, v. *ěks-pěk'tō-rāt* [L. *expēctōrātus*, expelled from the breast—from *ex*, out of; *pectus*, the breast; F. *expectorer*]: to eject matter from the air-passages or lungs by coughing and spitting; to cough up. **EXPECTORATING**, imp. **EXPECTORATED**, pp. **EXPECTORATION**, n. *-rā'shūn* [F.—L.]: the act of discharging matter from the air-passages or lungs; the phlegm or mucus ejected by coughing: its examination is of the utmost value in diseases of the chest (see **BRONCHI**; **BRONCHITIS**; **CHEST**; **CONSUMPTION**; **PNEUMONIA**; ETC.). **EXPECTORANT**, n. a medicine that promotes discharges from the lungs: such medicines are Antimony, Squill, Ipecacuanha, Senega, Balsam of Tolu, Lobelia, Gum ammoniac, Asafoetida, Galbanum, etc. **ADJ.** that promotes the discharge of mucus secreted in the lungs or air-passages. **EXPECTORATIVE**, a. *-tīv*, having the quality of promoting expectoration.

EXPEDE, v. *ěks-pěd'* [F. *expédier*—from L. *expēdīrē*, to let loose]: in *Scotch law*, to dispatch; to expedite. **EXPEDING**, imp. **EXPEDDED**, pp.

EXPEDIENT, a. *ěks-pě'dī-ěnt* [F. *expédient*—from L. *expēdīēntem*, letting loose, extricating—from *ex*, *pēdēs*, the feet: It. *espediente*]: fit or suitable for the purpose; tending to promote some end; proper or necessary under the circumstances: N. a contrivance or shift; that which serves to promote or help forward any end or purpose. **EXPEDIENCE**, n. *-ěns*, or **EXPEDIENCY**, n. *-ěn-sī*, suitableness for the end or purpose intended: propriety under the particular circumstances of a case advantage.—**SYN.** of 'expedient, n. and expediency, n. . resource; shift; contrivance; self-interest; resort; substitute; means.

EXPEDITE, v. *ěks-pě-dīt* [L. *expēdītus*, loosed, set free—from *ex*, out of, *pēdēs*, the feet]: to quicken; to hasten; to facilitate the doing of anything: **ADJ.** easy; nimble; active. **EXPEDITING**, imp. **EXPEDITED**, pp. **EXPEDITELY**, ad. *-lī*, readily; hastily. **EXPEDITION**, n. *-dīsh'ūn* [F.—L.]: speed; quickness; march of an army for a hostile purpose; voyage of a ship or ships for any particular purpose; an enterprise or undertaking by a number of persons; the persons who form the undertaking. **EXPEDITIONARY**, a. *-ēr-ī*, consisting in an expedition. **EXPEDITIOUS**, a. *-ūs*, speedy; hasty; active; nimble. **EXPEDITIOUSLY**, ad. *-lī*. **SYN.** of 'expedite, v.': to accelerate; speed; dispatch; urge; instigate;—of 'expeditious': ready; prompt; alert; quick.

EXPEL, v. *ěks-pěl'* [L. *expellērē*, to thrust out or away—from *ex*, out of; *pello*, I drive: It. *espellere*]: to drive or force out; to force to leave; to eject; to throw out; to exclude; to banish; to dismiss a student from a school or college. **EXPELING**, imp. **EXPELLED**, pp. *-pěld'*. **EXPELLABLE**, a. *-lā-bl*, that can be driven out.

EXPEND, v. *ěks-pěnd'* [L. *expendērē*, to weigh out, to spend money—from *ex*, out of; *pendo*, I weigh]: to lay out; to spend; to employ: to use. **EXPENDING**, imp. **Ex-**

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EXPENDED, pp. **EXPENDITURE**, n. -pən'dī-tūr, a laying out, as of money, time, or trouble; that which is thus expended; disbursement. **EXPENSE**, n. -pěns' [L. *expensus*, weighed out]: cost; charges; a laying out, as of money; a consuming, as of labor or time; that which is used or consumed. **EXPENSELESS**, a. without cost. **EXPENSIVE**, a. -siv, costly; high-priced; extravagant; given to expense. **EXPENSIVELY**, ad. -lī. **EXPENSIVENESS**, n. costliness.—**SYN.** of 'expense': price; value; worth; disbursement; outlay; consumption.

EXPENSES (or **COSTS**) OF A **LAW SUIT**: charges exigible from the parties to lawsuits. For the arrangements adopted in England, and for the usage in the United States, see **COSTS**. In Scotland, these charges are commonly spoken of as expenses; and the pursuer of an action at law in Scotland almost always asks the court to pronounce decree in his favor for the expense of the proceedings which he has found it, or may find it, necessary to institute. On the other hand, the defender usually demands the expense attending his defense; and the general rule is, that the party found ultimate in the wrong has decree pronounced against him for the expense which he has occasioned to his opponent, as well as for the subject-matter of the suit. As it is quite usual for a party to succeed in one branch of his action, and to fail in another; or to occasion unnecessary expense by the unskilful or careless mode in which he conducts some portion of it, even though on the whole he be in the right; the adjustment of the amounts incurred by the parties respectively often involves not only much nicety of calculation, but questions of considerable legal difficulty: see **AUDITOR** and **SHERIFF**.

EXPERIENCE, n. ěks-pě'rī-ěns [F. *expérience*—from L. *experiri*, to try, practice, experience—from *experior*, I try, I put to the test]: knowledge gained by frequent trial or by experiment; practice; knowledge from observation. **V.** to try and know by practice or experiment; to know by trial. **EXPERIENCING**, imp. **EXPERIENCED**, pp. -ěnst: **ADJ.** taught by practice or by repeated observations; skilful by means of trial and use. **EXPERIENTIAL**, a. -ěn'shūl, derived from experience. **EXPERIENTIALISM**, n. -shūl-izm, in *ment. phil.*, doctrine that all our ideas are derived from the experience of ourselves or of others, and that there are no intuitions. It has been called also **Sensationalism**. **EXPERIENTIALIST**, a. -ist, pertaining or relating to experientialism: **N.** one holding this doctrine.

EXPERIMENT, n. ěks-pě'rī-měnt [F. *expérimenter*, to experience—from mid. L. *experimentāre*, to prove, to try; L. *experimentum*, a proof, a trial]: a trial or operation for the purpose of discovering something unknown; a trial to confirm or disprove something doubtful: **V.** to search by trial. **EXPERIMENTING**, imp. making trials. **EXPERIMENTED**, pp. searched out by trial or experiment. **EXPERIMENTIST**, n. one who. **EXPERIMENTAL**, a. -tāl [F.—L.]: known by trial or experiment. **EXPERIMENTALLY**, ad. -lī. **EXPERIMENTALIST**, n. one who makes experiments. **EXPERIMENTATION**, n. -tū shūn, exercise or practice in ex-

EXPERIMENT—EXPIRE.

periment. EXPER'IMEN'TATIVE, a. -mĕn'tū-tĭv, experimental. EXPER'IMENTER, n. one who. EXPER'IMEN'TUM CRU'CIS, -mĕn'tūm krŏ'sis [L. *crucis*, of a cross—from *crux*, a cross]: a decisive or crucial experiment—SYN. of 'experiment, n.': proof; test; effort; attempt; endeavor; essay; trial; exertion; experience; operation; act.

EXPERIMENT and Observation: means by which we extend and confirm our knowledge of nature. An experiment is properly a proceeding by which the inquirer interferes with the usual course of a phenomenon, and makes the powers of nature act under conditions that, without his interference, would never, perhaps, have presented themselves all together. The introduction of experiment distinguishes the modern method of investigating nature from that of ancient times and of the middle ages. It is through experiment that physics and chemistry have made such rapid strides within the last two centuries. Through experiment, the investigator becomes master of the phenomena that he is considering; for he can contrive to set aside the unessential circumstances that so often conceal the real relations and conditions of things, and so can bring these out into the light. Experiments exhibited not for discovery of truth, but to aid in the exposition of truths already discovered, are sometimes called demonstrative experiments.

EXPERT, a. ĕks-pĕrt' [F. *expert*, skilful—from L. *expertus*, tried, proved]: ready; dexterous; skilful by practice: N. ĕks-pĕrt, one skilled in a science, an art, or in a profession; a scientific or professional witness: usually medical or scientific witnesses in a court of justice, selected for special qualifications, as in the case of an analysis of the contents of the stomach in suspected poisoning. The term is applied similarly to a person professionally skilled in handwriting, for detection of forgery of deeds and signatures. EXPERT'LY, ad. -lĭ. EXPERT'NESS, n. skill; readiness.—SYN. of 'expert a.': adroit; skilful; prompt.

EXPIATE, v. ĕks-pĭ-āt [L. *expĭātus*, made complete satisfaction for—from *ex*, out of; *pĭātus*, propitiated: It. *espĭare*: F. *expĭer*]: to make reparation or satisfaction for; to atone for. EXPIATING, imp. EXPIATED, pp. EXPI-ABLE, a. -ă-bl, that may be atoned for. EXPIA'TION, n. -ă-shŭn [F.—L.]: the act of making satisfaction for a crime by which the guilt is done away; atonement; satisfaction; the means by which the atonement is made. EXPIA'TOR, n. -tĕr, one who. EXPIA'TORY, a. -ă-tĕr-ă, having power to make atonement.

EXPIRE, v. ĕks-pĭr' [F. *expĭrer*—from L. *expĭrārĕ*, to breathe or blow out—from *ex*, out of; *spĭrĕ*, I breathe]: to breathe out; to exhale; to breathe the last breath; to die; to fail or be destroyed. EXPIRING, imp. breathing out: ADJ. dying; ending; pertaining to, or uttered at, the time of dying. EXPIRED', pp. -pĭrĕd'. EXPI-RABLE, a. -ră-bl, that may come to an end. EXPIRA'TION, n. pĭ-ră-shŭn [F.—L.]: the act of forcing the air from the lungs; exhalation; conclusion; termination of a limited time. EXPI-RATORY, a.

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-p'ĩrǎ-tér-ĩ, pertaining to the emission of air from the lungs.
EXPIRY, n. *ěks-p'ĩr'ě*, the termination or end.

EXPISCATE, v. *ěks-p'is'kāt* [L. *expiscātus*, searched out—from *ex*, out of; *piscis*, a fish]: to search out by artful means; to discover; to investigate. **EXPISCATING**, imp. **EXPISCATED**, pp. **EX'PISCA'TION**, n. *-kǎ shǔn*, a thorough search or investigation.

EXPLAIN, v. *ěks-plān'* [OF. *explaner*, to expand, to explain—from L. *explānāre*, to make plain or clear—from *ex*, out, *plānus*, smooth, plain, evident]: to make plain or evident; to clear of obscurity; to expound. **EXPLAINING**, imp. **EXPLAINED'**, pp. *-plānd'*. **EXPLAIN'ABLE**, a. *-ǎ-bl*, capable of being made plain to the understanding. **EX'PLANA'TION**, n. *-plǎ-nǎ' shǔn*, the act of explaining; an exposition; an interpretation; sense explained; a mutual clearing up of a misunderstanding. **EXPLAN'ATORY**, a. *-plān'ǎ-tér-ĩ*, serving to explain; containing an explanation. **EXPLAIN'ER**, n. one who. **EXPLANATE**, a. *ěks'plā-nāt*, in *entom.*, having the sides of the prothorax so depressed and dilated as to form a broad margin.—**SYN.** of 'explain': to expiscate; elucidate; illustrate; interpret; clear up; define; describe; explicate; recite; recount; detail.

EXPLETIVE, a. *ěks'plē-tiv* [F. *expletif*—from L. *expletivus*, filling up—from *ex*, out of; *plēō*, I fill]: filling up or out; added for supply or ornament; not necessary to the sense: N. a word or syllable inserted for ornament, or only used to take up room; *colloquially*, a coarse or profane word. **EX'PLETORY**, a. *-tér-ĩ*, serving to fill up.

EXPLICATE, v. *ěks'plī-kāt* [L. *explicātus*, unfolded or spread out—from *ex*, out of; *plīcō*, I fold: It. *esplicare*: F. *expliquer*]: to interpret; to explain; to clear of difficulties. **EX'PLICATING**, imp. **EX'PLICATED**, pp. **EX'PLICATOR**, n. *-tér*, one who. **EX'PLICABLE**, a. *-ká-bl*, that may be explained or interpreted. **EX'PLICA'TION**, n. *-kǎ' shǔn* [F.—L.]: interpretation; explanation. **EX'PLICA'TIVE**, a. *-ká tiv*, or **EX'PLICA'TORY**, a. *-tér-ĩ*, serving to explain or interpret.

EXPLICIT, a. *ěks-plis'it* [F. *explicite*—from L. *explicītus*, disentangled, free from obstacles (see **EXPLICATE**)]: clear; plain; not ambiguous or obscure. **EXPLIC'ITLY**, ad. *-lǐ*. **EXPLIC'ITNESS**, n. clearness or plainness in language. **EXPLICIT FUNCTION**, n. in *math.*, a function whose value is expressed directly in terms of the variable; thus, in the equation

$$y = ax^2 + bx^{\frac{1}{2}} + c,$$

y is an *explicit function*. The term is opposed to *implicit function*, in which the relation between the function and variable is not directly stated; as, for example, in the equation

$$y^2 - 2px = 0,$$

in which *y* is an *implicit function* of *x*.—**SYN.** of 'explicit': express; unreserved; open; unambiguous; explanatory; unobscure.

EXPLODE, v. *ěks-plōd'* [OF. *exploder*, to explode—from L. *explōdēre*, to drive out or off by clapping—from *ex*, out

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of; *plaudo*, I clap the hands in token of approbation—*lit.*, to drive out by clapping the hands]: to burst forth with sudden violence and noise; to change instantaneously into the gaseous state with enormous force; to burst with force and a report, as gunpowder; to drive from notice; to cry down, as a fashion or an opinion. **EXPLO'DING**, *imp.*: **ADJ.** having the property of bursting forth with violence and noise. **EXPLO'DED**, *pp.*: **ADJ.** rejected; condemned; burst violently. **EXPLO'DER**, *n.* one who. **EXPLO'SION**, *n.* -*plō'-zhūn* [*L. explōsūs*, driven off by clapping the hands: *F. explosion*]: a bursting forth with violence and noise; a sudden expansion with noise, the result of a change into the gaseous state; that which is thus exploded; the noise itself. **EXPLOSIVE**, *n.* -*ēks-plō'siv*, a substance such as gunpowder, dynamite, and the like, which, by contact with heat or by means of friction, is instantaneously changed into the gaseous state with immense force: **ADJ.** having a tendency to explode; having the property of exploding. **EXPLO'SIVELY**, *ad.* -*lī*. **EXPLO'SIVENESS**, *n.* liability to explode.

EXPLOIT, *n.* -*ēks-ployt'* [*F. exploit*, an exploit: *OF. exploit*, revenue, profit—from *L. explicītārē* for *explicārē*, to unfold, to spread out; *explicītus*, unfolded]: an act or a deed, especially a heroic one; an achievement; a deed of renown. **EXPLOITATION**, *n.* -*ēks'ploy-tā'shūn*, or **EXPLOIT'ING**, *n.* [*F. exploitation*—from *exploiter*, to perform a feat]: the improvement of lands by cultivation, the felling of wood, the working of mines, and similar undertakings; the examination instituted for that purpose. **EXPLOIT'ED**, *a.* searched out and seized, as by an armed party.

EXPLOITS, *ēks-ployts'*, **RIVER OF**: chief water-course of Newfoundland; flowing from s.w. to n.e. nearly the whole breadth of the island, and emptying into E. Bay; length 150 m. It is navigable for steamboats to the rapids, 12 m. from its mouth, and from that point by small boats to within 50 m. of the s.w. coast, and drains about 3,000 sq. m., nearly all the habitable land of the interior. Its valley is rich, and has abundance of timber, game, and fish.

EXPLORE, *v.* -*ēks-plōr'* [*F. explorer*—from *L. explōrārē*, to search out, to seek to discover—from *ex*, out of; *plōrō*, I cry out: *It. esplorare*]: to search into or examine closely with the eye in order to discover; to examine thoroughly, as to explore new countries; to search by any means; to try to find out. **EXPLO'RING**, *imp.* **EXPLORED**, *pp.* -*plōrd'*. **EXPLO'RER**, *n.* one who penetrates a new country for the purpose of thorough examination; also **EXPLORA'TOR**, *n.* -*plō-rā'tēr*, one who. **EXPLORA'TION**, *n.* -*shūn* [*F.—L.*]: close search; strict examination. **EXPLOR'ATORY**, *a.* -*ā-tēr-ī*, serving to explore; searching out.—**SYN.** of 'explore': to search; examine; investigate; inspect; scrutinize; seek; penetrate.

EXPLOSIVES.

EXPLO'SIVES: substances which, by the agency of heat or flame, or by friction or percussion, may be instantaneously changed into the gaseous state with great force. Modern explosives may be referred to classes, as follows: 1. NITRO-GLYCERINE (q.v.) is used as the basis for a large number of characteristic compounds. 2. FULMINATES (q.v.) form a definite class. 3. NITRO-CELLULOSE (see GUN-COTTON) is the basis for an important division. 4. SPRENGEL EXPLOSIVES is a name for a distinct line of products (see below). 5. PICRIC ACID COMPOUNDS—*Melinite* (see below), etc. 6. UNCLASSIFIED are agents such as *Emmensite* and *Gelbite* (see below).—For class 2, see FULMINATES: examples of the other classes are given below. No claim to completeness can be made, as new explosives are appearing continually. The pressing need of a smokeless powder for the new rapid-firing and machine guns has greatly stimulated the energies of inventors. Speaking generally of all the explosives mentioned below, any of them can be used for torpedoes; all can be used for blasting. All are 'smokeless powders,' approximately; but it must be understood that this is, as yet, a question of degree only.

NITRO-GLYCERINE EXPLOSIVES.—The following two are examples of a numerous class in which Nitro-glycerine (q.v.) is the active agent, and is mixed with inert substances, as in dynamite, or with such as contribute to the explosion, as in gelatin explosives: *Explosive Gelatin*, Nitro-glycerine (q.v.) solidified by Gun-cotton (q.v.). Seven per cent. or more of gun-cotton is incorporated with nitro-glycerine, which mixes perfectly with it, giving a jelly-like product of high explosive value, and carrying no inert residue. The gun-cotton may be dissolved in a solvent such as methyl nitrate, and a mixing agent, such as acetic acid, may be added; and then the collodion thus made may be mixed with the gun-cotton: or, by simple heat, gun-cotton may be directly dissolved in nitro-glycerine. The ultimate product is, in all cases, identical. Camphor may be added to diminish its sensibility to shock. Its density is 1.6; at a temp. of 122° F. to 140° F., it softens a little. In the open air, it burns quietly if ignited.—*Forcite* (for blasting and torpedoes), mixture of Nitro-glycerine (q.v.) with cellulose, the latter gelatinized by heating in water under pressure. This was its original composition; but it has been modified, and now is made of thin explosive Gelatin (q.v.) and nitro-cellulose (Gun-cotton, q.v.), with sodium nitrate, coated with sulphur and wood tar. One per cent. of wood pulp is added to the tar. The effect of the mixture is to prevent the gelatin from being absorbed by the base, which represents a carrier rather than an absorbent. Explosive gelatin is used in the shells of the Zalinski gun.

GUN-COTTON EXPLOSIVES.—*Tonite* is a mixture of finely macerated gun-cotton with about its own weight of barium nitrate. *Punshon's gun-cotton* (blasting and torpedoes) is coated or impregnated with sugar, so as to pre-

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serve a granular constitution, and insure regularity of action. Other solids, such as wood fibre, manna sugar, glucose, and starch (Uchatius's white powder), have been nitrated for production of explosives.

SPRENGEL EXPLOSIVES.—Name given to a large class of explosives which promise to acquire considerable importance. The essential principle is the mixture of a combustible with an oxidizing agent, normally at the time of, or just before, explosion. One of this group, *Rack-a-rock* (for blasting), was used in the great explosion at Hell Gate, New York, 1885. This consists of compressed cartridges of chlorate of potash, which, immediately before use, are impregnated—(a) with dead oils or other liquid hydrocarbons, or (b) with nitro-benzol, or (c) with a mixture of dead oils and bisulphide of carbon; to the last, 3 per cent. of sulphur is sometimes added. This is given in detail, as typical of a class to which a great many explosives can be referred, such as the following: *Roburite*, *Securite*, and *Bellite*, mixtures of nitrate of ammonium, or its equivalent, with nitrated hydrocarbons—mostly for blasting.—*Favier's Explosive*, mass of a solid nitrate, such as ammonium, sodium, or potassium nitrate, which has been heated with solid paraffin, and pressed: sulphur may be added to the mixture: it is principally for blasting.—*Hellhoffite*, mixture of nitrated tar oils, or nitrated petroleum, with nitric acid. This was proposed to be used in ordnance as an explosive for shells. The two components were to be kept separate in the shell, and to be mixed automatically after discharge or on impact.—*Panclastite*, term embracing a series of mixtures of liquid hydrocarbons with solid or liquid oxidizing agent. This type is the invention of Eugène Turpin, of Paris, inventor of *Melinite*: it is principally for blasting.

PICRIC ACID EXPLOSIVES.—*Melinite*. (Fr. *Mélinite*), explosive for use in guns and in shells; invention of Eugène Turpin, of Paris. Its composition, though held a secret by the French govt., is now known with some definiteness. Turpin found that picric acid could be exploded with great effect entirely alone, and that, very curiously, the maximum effect is produced by an incomplete combustion giving carbon monoxide gas (CO) as the characteristic product. But, in practice, the oxygen of the air instantly oxidizes this to the dioxide (CO₂), so that the air is made a *quasi* constituent of the explosive. Melinite is made by compressing, agglomerating, and molding picric acid into proper shapes. As an agglomerate, an aqueous solution of gum arabic or fats or heavy oils may be used, or collodion jelly diluted with 20 to 30 times its weight of alcohol and ether. Sometimes the picric acid is simply fused and molded by heat. The mixtures of agglomerants tend to decrease its sensibility. The most authentic view regards Melinite as essentially plain picric acid, exploded in practice by a fulminating primer. The most exalted claims are made for its power.—*Lydite* is an explosive compound

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supposed to resemble Melinite, and extensively experimented with by the Brit. government.

UNCLASSIFIED EXPLOSIVES.—*Emmensite*, for blasting, is prepared by melting together, in a paraffin bath, 5 parts of 'emmens' acid, 5 parts of a nitrate (sodium or potassium nitrate being recommended), and then incorporating 6 parts of picric acid. The so-called 'emmens' acid is obtained by dissolving commercial picric acid in fuming nitric acid of 50–52° Beaumé, at a gentle heat. On evaporation, the new acid is deposited in yellow rhombohedral crystals.

Gelbite is a form of *Emmensite*. A special quality of paper is chemically treated so as to become presumably nitro-cellulose, or a more or less perfect *Gun-cotton* (q.v.). This paper is impregnated or saturated with *Emmensite*. *Gelbite* appears like sheets of yellow paper. This is cut into strips or pieces of suitable size. Thus, for gun and pistol cartridges, a long strip is rolled to a suitable diameter, to fit the cartridge shell or barrel. It is for use also in blasting. One grain is said to be equal in power to seven grains of gunpowder.

EXPONENT, n. *eks-pō'nēnt* [L. *exponen'tem*, putting or setting out—from *ex*, out of; *pōnō*, I put or set]: in *arith.* or *alg.*, the number or figure placed at the upper part on the right of a figure or letter to indicate the power to which it is to be raised, thus, b^2 , 3^2 —or the root of a quantity, thus, $b^{\frac{1}{2}}$, $3^{\frac{1}{3}}$; the representative of a party, as setting forth their views; one who expounds the views of another. **EXPONENTIAL**, a. *-nēn'shāl*, pertaining to exponents, or certain curves or equations, etc. When it was wanted to express the multiplication of unity for any number of successive times by the same number or quantity, e.g., $1 \times 5 \times 5$, or $1 \times a \times a \times a$, it was found a convenient abbreviation to write 1×5^2 and $1 \times a^3$, or simply, 5^2 and a^3 ; and the numbers, 2 and 3, indicating how often the operation of multiplication is repeated, were called exponents. But the theory of exponents gradually received extensions not originally contemplated, and has now an extensive notation of its own.

Thus, $a^0 = 1$, $a^1 = a$, $a^{-2} = \frac{1}{a^2}$, $a^{\frac{1}{2}} = \sqrt{a}$, $a^{\frac{1}{3}} = \sqrt[3]{a}$, $a^{\frac{2}{3}} = \sqrt[3]{a^2}$,

or the cube root of the square of a . Also, a^x is the x th power of a , x being any number integral or fractional; and, a continuing the same, x may be so chosen that a^x shall be equal to any given number. In this case, x is called the logarithm of the number represented by a^x . Considered by itself, a^x is an exponential. Generally, any quantity representing a power whose exponent is variable is an exponential, as a^x , x^x , y^x , etc. Exponential equations are those which involve exponentials, such as $a^x = b$, $x^x = c$. Exponents were introduced into algebraic notation by Descartes. **EXPONENT PROPOSITION**, proposition which states in regular logical form the meaning of another proposition which is obscure as judged by logical rules. **EXPONIBLE**, a. *-ible*, explicable; having the quality of admitting or of needing exposition. **EXPONIBLE PROPOSITION**, proposition that is

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obscure in the sense that it is not in one of the recognized logical forms.

EXPORT, v. *ěks-pōrt'* [F. *exporter*—from L. *exportāre*, to carry out, to convey away—from *ex*, out of: *porto*, I carry: It. *esportare*]: to carry or send produce or goods out of a country, either by land or by water, in course of trade. **EXPORT'ING**, imp. **EXPORT'ED**, pp.: **ADJ.** carried out of a country in the regular course of traffic. **EXPOR'TER**, n. one who. **EXPOR'TABLE**, a. *-tū-bl*, that may be exported. **EX'PORTA'TION**, n. *-pōr-tā'shūn* [F.—L.]: the act of conveying goods from one country to another, as by a merchant or trader. **EXPORT**, n. *ěks-pōrt*, an article or commodity carried out of one country to another in the regular course of traffic.

EXPORTS: see **IMPORTS AND EXPORTS**.

EXPOSE, v. *ěks-pōz'* [OF. *eaposer*, to expose, to lay out—from L. *ex*; OF. *poser*, to set, to place: L. *eapositus*, put or set out—from *ex*, out of; *positus*, put or placed]: to set out to public view; to exhibit; to disclose; to lay open; to make bare; to put in danger; to offer for sale. **EXPO'SING**, imp. **EXPOSED'**, pp. *-pōzd'*: **ADJ.** laid bare; unsheltered; uncovered; made public; offered for sale. **EXPO'SER**, n. one who. **EXPO'SURE**, n. *-pō'zhūr*, the state of being laid open to danger or inconvenience; situation of a place in regard to the points of the compass, or to sun and air; the laying open the character or conduct of any one; the act of exposing anything. **EXPOSURE OF INFANTS**: see **INFANTICIDE**. **EX'POS'I'TION**, n. *zish'ūn* [F.—L.]: a setting forth to public view; a laying open; an exhibition; an explanation or interpretation. **EXPOS'ITIVE**, a. *-pōz'ī-tīv*, or **EXPOS'ITORY**, a. *-tér-ī*, explanatory; serving to explain. **EXPOS'ITOR**, n. *-ī-tér*, one who explains, interprets, or expounds.

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EXPOSÉ, n. *ěks'pō-zū'* [F. *exposé*]: an exposing of some thing previously concealed; a formal recital of facts; reasons for explanation.

EX POST FACTO, *ěks' pōst fāk'tō* [L. *ex*, out of; *post-factus*, done afterward]: after the deed is done; applied to a law enacted to meet a particular crime after the deed has been committed. The Constitution of the United States prohibits the passing of such laws: the prohibition applies only to criminal and penal statutes.

EXPOSTULATE, v. *ěks-pōs'tū-lāt* [L. *expōstulātus*, demanded urgently, found fault—from *ex*, out of; *pōstulātus*, required or demanded]: to reason earnestly with, as on some impropriety of conduct; to remonstrate in a friendly manner. **EXPOS'TULATING**, imp. **EXPOS'TULATED**, pp. **EXPOS'TULATOR**, n. *-tēr*, one who. **EXPOS'TULA'TION**, n. *-lā'shūn*, the act of reasoning with a person with reference to his conduct. **EXPOS'TULA'TORY**, a. *-lū'ter-ī*, containing expostulation.

EXPOSURE: see under **EXPOSE**.

EXPÓUND, v. *ěks-pownd'* [OF. *espondre*, to explain—from L. *expōnērē*, to put or set up—from *ex*, out of; *pōnō*, I set or place]: to make clear; to explain; to lay open; to interpret. **EXPOUND'ING**, imp. **EXPOUND'ED**, pp. **EXPOUND'ER**, n. one who.

EXPRESS, a. *ěks-prēs'* [F. *exprès*, plain, clear, on purpose—from L. *expressus*, squeezed out, represented—from *ex*, out of; *pressus*, pressed or sunk down]: plain; clear; given in direct terms; sent on a particular errand; intended for a particular purpose; copied, or resembling—applied to painting, sculpture, etc.; employed as a direct and speedy conveyance; used *adverbially*, on purpose; for a particular end: N. any direct and fast conveyance; a messenger or vehicle sent for a particular purpose; a special message: V. to press or squeeze out; to declare in words; to utter; to represent; to denote. **EXPRES'SING**, imp. **EXPRESSED'**, pp. *-prēs't'*: **ADJ.** squeezed out, as juice; uttered; set down in writing. **EXPRES'SLY**, ad. *-lī*, in direct terms; plainly. **EXPRES'SION**, n. *-prēsh'ūn* [F.—L.]: manner of utterance; mode of speech; declaration; a natural and lively representation of an object in painting or sculpture; the transient change which takes place in the permanent form of a face or figure while under the influence of various emotions; the modulation of the voice suited to the subject in music; the appearance of the countenance; the representation of an algebraic quantity by its proper symbols. **EXPRES'SION-LESS**, a. wanting in expression. **EXPRES'SIBLE**, a. *-prēs'si-bl*, that may be squeezed out; that may be uttered. **EXPRES'SIBLY**, ad. *-blī*. **EXPRES'SIVE**, a. *-sīv*, serving to utter or represent; representing emphatically or clearly; significant. **EXPRES'SIVELY**, ad. *-lī*. **EXPRES'SIVENESS**, n. the quality of being expressive. **EXPRES'SNESS**, n. the quality of being express. **EXPRESSURE**, n. *ěks-prēsh'ūr*, in *OE.*, expression; utterance; form or likeness; impression. —**SYN.** of 'express, v.': to declare; testify; intimate; signify; squeeze out; extort; elicit; indicate; exhibit;

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designate;—of 'expression': term; word; phrase; sentence; proposition; period; paragraph; indication; form; mode.

EXPRESS, *ěks-prěs'*: organization for quick transmission of goods, merchandise, and parcels of all kinds. The express business in the United States had its rise in the custom of intrusting to stage-coach drivers, conductors of railroad trains, clerks of steamboats, commercial travellers, etc., parcels for delivery at their respective destinations. This was done without any system or organization, till William F. Harnden, of Boston, a railroad employé, conceived the idea of arranging for a regular package-delivery service between Boston and other cities and towns in Mass. He contracted with the Boston and Worcester r.r. co., 1838, for the transmission of packages over its line. In 1839, March, appeared, in the Boston newspapers, Harnden's announcement of a collection and delivery service between Boston and New York; and on March 4 he made his first trip, *via* the Boston and Providence r.r. and steamboat on Long Island Sound. His packages were carried in his hand-bag, and consisted of books from Boston publishers, orders from them to publishers in New York, and some notes of western, southern, and New York state banks, forwarded by brokers for exchange with issues of New England banks: a stout trunk soon took the place of the hand-bag. Besides carrying parcels, Harnden undertook to have an oversight of common freight, and to secure its prompt delivery in New York. His express service was extended to Philadelphia 1840, to Albany, N. Y., 1841. His partner, Dexter Brigham, went to England 1840, and established agencies in the principal European cities for express service proper, as well as for the sale of passage-tickets to emigrants, and the purchase and sale of foreign exchange. Harnden disposed of his Boston, Springfield, and Albany line abt. 1843 to Thompson & Co., who gave it their name. Harnden died 1845. A monument was erected to his memory, 1866, in the Mt. Auburn Cemetery, Cambridge, Mass., by 'the express companies of the United States.'

A rival line between Boston and New York was begun by Alvin Adams 1840: its collections and deliveries were for a year or two restricted to those 2 cities and the intermediate towns—New London, Norwich, and Worcester. Adams associated with himself, as partner, William B. Dinsmore, 1841, who took charge of the New York office: Adams & Co. opened their first office in Philadelphia 1843, and the same year Adams's partner and agent at Philadelphia associated himself with Samuel M. Shoemaker, to establish a line to Washington. At the outbreak of the civil war, Adams & Co.'s lines extended throughout a large part of New England, the whole south, and the northern states along the boundary between north and south. Henry Wells, an employé of Harnden, in association with Crawford Livingston, established a weekly line between Albany and Buffalo 1841: it became a daily line 1843. and the same year

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offices were opened at points on the Hudson river, between Albany and New York. Wells & Co. (one of the partners being William G. Fargo) opened a line to Chicago 1845; the same year they carried letters between New York and Buffalo for 6 cents, the post-office charging 12: Wells & Co. also established a European E. 1846, with offices in London and Paris. In 1852 the firm of Wells, Fargo & Co. was founded for conducting the E. business in the far west and the Pacific states and territories: it purchased the rights, good-will, etc., of the Erie E. Co, 1888.

The corporation known as the Adams Express Co. was formed 1854 by the union of Adams & Co., Harnden & Co., Thompson & Co., Kinsley & Co., and Hoey & Co.: in 1887 the Adams Express Co. had 7,800 employés, 1,826 wagons, 2,235 horses, and operated on 23,000 m. of railroad. The American Express Co. is a consolidation, effected 1850, of Livingston & Fargo, Wells & Co., and Butterfield, Warner & Co. The Eastern Express Co. is a consolidation of several individual lines in the New England states. The National Express Co. had for its nucleus Pallen, Virgil & Stone's express, founded 1848, as a line between New York and Montreal. The nucleus of the United States Express Co. was the express business of the New York and Erie r.r.: it has absorbed the Delaware and Lackawanna Express Co., the Western Express Co., and the Baltimore and Ohio Express Co. Besides safe delivery of goods, E. companies undertake to collect, on account of merchants, the price of goods sold and forwarded by express: this process is known as the system of C. O. D., or 'collect on delivery.' Such parcels are marked on the outside with the amount to be collected, and are accompanied by the merchant's bill. The cost of the collection is paid by the consignor; that of transportation either by the consignee or the consignor, according to agreement. This feature of the E. business is growing rapidly, especially within a radius of 50 m. around the chief cities, where merchants deliver their goods by express, free of transportation charge. The E. companies have also a system of money-orders payable at any of their offices throughout the country. The most profitable branch of the E. business is the collection of notes, drafts, and accounts, and the transportation of gold and silver coin, bank-notes, deeds, bullion, and valuables of all kinds. The U. S. govt. contracts with one of these companies (the U. S. E. Co. 1890) for the carrying and delivery of all public moneys and securities. The contracts between the E. companies and railroad companies are based on a given minimum rate *per diem*, for a stipulated amount of traffic; when that amount is exceeded, an additional charge is made. Before the law, an E. co. is a 'common carrier,' with the same liabilities as any other common carrier, notwithstanding any declaration on its bills of lading that it is not to be so considered.

The New York *Commercial and Financial Chronicle*,

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1890, Nov. 29, reports as follows on the finances of the E. cos. named below: Adams E. Co., stock, par value \$100, amount outstanding \$12,000,000; American E. Co., stock, par value \$100, amount outstanding \$18,000,000; dividends of 6 per cent. yearly have been paid since 1879: United States E. Co., stock, par value \$100, amount outstanding \$10,000,000; purchased the Baltimore and Ohio E. Co. 1887; dividends payable May and Nov.; 1890 the semi-annual dividends were 2 per cent. each: Wells, Fargo & Co. E., stock, par value \$100, amount outstanding \$6,250,000; no annual reports or information; dividends of 8 per cent. yearly have been paid for many years.

On the New York stock exchange, 1890, Dec. 5, Adams E. Co. stock was sold at \$145; American E. Co. stock \$115; Wells, Fargo & Co. stock \$140½.

EXPRESSIONE—EXQUISITE.

EXPRESSIONE, *ěks-prěs-sě-ō'ně*, CON, or **ESPRESSIVO**, *ěs-prěs-sě'vō*: Italian term in music, meaning with expression; impassioned, with pathos. Where the word appears at the beginning of a composition, the piece must be executed throughout with feeling. 'Expressione' frequently appears above certain passages which alone are to be performed so, while the harmony in the accompaniment goes on quietly.

EXPRESSIVO, adv. *ěks-prěs-sě'vō*, or **ESPRESSIVO**, adv. *ěs-prěs sě'vō* [It. *espressivo*]: in *mus.*, with expression.

EX PROFESSO, phrase, *ěks pro-fěs'ō* [L.]: by profession; professedly.

EXPROPRIATE, v. *ěks-prō'pri-āt* [mid. L. *expropriātus*—from L. *ex*, out of; *propriūs*, one's own]: to hold no longer as one's property; to make no longer one's own. **EX PROPRIA'TION**, n. *-ā'shūn* [F. *expropriation*, a taking possession of a debtor's landed property]: the act of holding no longer as one's own.

EXPULSION, n. *ěks-pŭl'shūn* [F. *expulsion*—from L. *expulsiōnem*, a driving out—from *ex*, out of; *pulsus*, driven: It. *espulsione*]: the act of expelling by authority, force, or violence; ejection. **EXPULSIVE**, a. *-siv*, having the power of driving out. **EXPULSE**, v. *ěks-pŭls'*, in *O.E.*, to drive out; to expel.

EXPUNGE, v. *ěks-pŭnj'* [L. *expungĕrĕ*, to blot out—from *ex*, out of; *pungo*, I prick or puncture: It. *espungere*]: to blot or wipe out; to efface; to obliterate. **EXPUNG'ING**, imp.: **ADJ.** blotting out; erasing. **EXPUNGED'**, pp. *-pŭnjd'*.—**SYN.** of 'expunge': to erase; cancel; strike out; destroy.

EXPURGATE, v. *ěks-pĕr'gāt* [L. *expŭrgātus*, purged quite, purified—from *ex*, out of; *pŭrgātus*, cleansed: It. *espurgare*]: to cleanse; to purify; to purge. **EXPUR'GATING**, imp. **EXPUR'GATED**, pp.: **ADJ.** cleansed; purified. **EXPUR'GATOR**, n. *-gā-tĕr*, one who expurgates or purifies. **EXPURGA'TION**, n. *-gā'shūn*, the act of cleansing or purifying. **EXPUR'GATORIAL**, a. *-tō'rĭ-āl*, cleansing or freeing from blame. **EXPUR'GATORY**, a. *-gā-tĕr-ĭ*, serving to purify or cleanse. **INDEX EXPURGATORIUS**, *ĭn'děks ěks-pĕr'gā-tō'rĭ-ŭs*, a list of works condemned by the R. Cath. Ch. as either heretical or dangerous to the Roman Catholic faith.

EXQUISITE, a. *ěks'kwĭ-zĭt* [L. *exquisitus*, carefully sought out, excellent—from *ex*, out of; *quæsitus*, sought or searched for: F. *exquis*, exquisite, excellent—*lit.*, carefully sought out]: perfect; complete; highly finished; capable of nice or delicate perception; very sensibly felt; nice; delicate; exact; extreme, as pain or pleasure: N. one nice or refined in dress; a fop; a dandy. **EX'QUISITELY**, ad. *-lĭ*. **EX'QUISITENESS**, n. state of being exquisite; nicety; keenness.—**SYN.** of 'exquisite, a.': refined; consummate; matchless; accurate; exceeding; extreme; keen; fastidious.

EXSANGUIOUS—EXTEND.

EXSANGUIOUS, a. *ĕk-săng'gwî-ûs*, or **EXSAN'GUINOUS**, a. *-gwî-nûs* [L. *exsanguis*, bloodless—from *ex*, out of; *sanguis*, blood]: without blood. **EX'SANGUIN'ITY**, n. *-gwî'n-î-tî*, state of being without blood.

EXSCIND, v. *ĕk-sînd'* [L. *ex*, from; *scindo*, I cut or tear]: to cut off from fellowship; to remove or separate entirely. **EXSCIND'ING**, imp. **EXSCIND'ED**, pp.

EXSERTED, a. *ĕk-sér'téd* [L. *exsertus*, thrust forth]: in *bot.*, projecting beyond something else, as stamens beyond the corolla.

EXSICCATE, v. *ĕk'sîk'kât* [L. *exsiccatus*, made quite dry—from *ex*, out of; *siccus*, dried up]: to deprive of moisture. **EXSIC'CATING**, imp. **EXSIC'CATED**, pp. dried up. **EXSIC'CANT**, a. *kânt*, having power to dry up. **EX'SICCA'TION**, n. *-kâ'shûn*, the drying up of solid bodies; the expulsion of moisture from solid bodies by heat, pressure, or by any other means. **EXSICCATOR**, n. *ĕks'sîk-kâ-tér*, apparatus for drying purposes. In most cases such substances are used as chloride of calcium, which readily absorbs moisture.

EXSTIPULATE, a. *ĕks-stîp'û-lât* [L. *ex*, without; *stipulâ*, a stalk or stem]: in *bot.*, destitute of stipules.

EXSUDE and **EXSUDATION**: old spellings of **EXUDE** and **EXUDATION**: see **EXUDE**.

EXSUFFLICATE, a. *ĕks-sŭf'ŭ-kât* [mid. L. *exsufflārē*, to blow at, to despise]: in *OE.*, blown or puffed out; empty; contemptible.

EXTANT, a. *ĕks-tănt'* [L. *exstantem*, projecting—from *ex*, out of; *stans*, standing]: in existence; not destroyed or lost.

EXTEMPORANEOUS, a. *ĕks-têm'pô-râ'nî-ûs* [Sp. *extemporaneo*, extemporaneous—from L. *ex*, out of; *tempus*, time, *temporâ*, times]: done or uttered without preparation; unpremeditated; not having the aid of MS. **EXTEM'PORA'NEOUSLY**, ad. *-lî*. **EXTEM'PORA'NEOUSNESS**, n. **EXTEM'PORARY**, a. *-rér-î*, unpremeditated; without preparation; sudden. **EXTEM'PORAR'ILY**, ad. *-lî*. **EXTEMPORE**, ad. *ĕks-têm'pô-rê* [L. *ex*, *temporê*]: on the spur of the moment, without preparation; without the aid of MS. **EXTEM'PORIZE**, v. *-rîz*, to speak without preparation; to improvise. **EXTEM'PORIZING**, imp. **EXTEM'PORIZED**, pp. *-rîzd*. **EXTEM'PORIZER**, n. *-rî-zér*, one who.

EXTEND, v. *ĕks-tënd'* [L. *extendĕrē*, to spread out; *extensus*, spread out—from *ex*, out of; *tendo*, I pull or stretch: It. *estendere*: F. *étendre*]: to stretch in any direction, to any distance; to enlarge or increase; to diffuse; to reach; to impart. **EXTEND'ING**, imp. **EXTEND'ED**, pp.: **ADJ.** spread; expanded. **EXTEND'EDLY**, ad. *-lî*. **EXTEND'ER**, n. he or that which extends. **EXTEN'DIBLE**, a. *tên'dî-bl*, capable of being stretched or enlarged: in *law*, that may be seized under a writ of extent and valued. **EXTENDIBILITY**, n. *-bîl'î-tî*, capability of being extended, stretched, enlarged, or expanded. **EXTENSIBLE**, a. *ĕks-tên'sî-bl* [L. *extensus*, stretched out]: that may be extended. **EXTEN'SIBIL'ITY**, n. *-bîl'î-tî*.

EXTENDANT—EXTENSION.

the capacity of being extended. **EXTEN'SILE**, a. -síl, capable of being extended. **EXTEN'SION**, n. *těn'shîn* [F.—L.] the act of enlarging or stretching out; enlargement; an essential property of bodies, because they must occupy a part of space, however small; in *logic*, the number of objects which a term includes. **EXTEN'SIVE**, a. -siv, large; wide; **EXTEN'SIVELY**, ad. -lî. **EXTENSIVENESS**, n. state of being extensive; largeness; wideness. **EXTEN'SOR**, n. -sēr, in *anat.*, a muscle which serves to extend or straighten a joint: **EXTENT**, n. *ěks-těnt'* [L. *extentus*, stretched out]: the space or degree to which a thing is extended; compass; size; in *O.E.*, extended. **EXTENT**, in *English law*, writ issuing out of the court of exchequer to compel payment of debts to the crown. In order to warrant the issue of this writ, the debt must be a debt of record (q.v.). As to *extent* in Scotland, there were no taxes in feudal times. The king was supported by the rents of his property lands, and by the occasional profits of superiority—ward, non-entry, marriage, escheat, and the like—known by the general name of casualties (q.v.). Beyond these, and the expenses which the discharge of his ordinary duties to his superior imposed on him, the vassal was not liable to be taxed. But to this rule there were some exceptions. When it became necessary to redeem the king from captivity, to provide a portion for his eldest daughter, or to defray the expense of making his eldest son a knight, a general contribution was levied. One of these occasions occurred when Alexander III. betrothed his daughter Margaret to Eric, the young king of Norway, and engaged to give her a tocher of 14,000 merks. This sum was far beyond the personal resources of the king, and consequently fell to be levied by a land-tax—land and its fruits being then the only appreciable species of property. But if the tax was to be levied fairly and equally, this could be only by ascertaining the value of the whole lands in the kingdom, as had been done in England in the time of Edward I. (4 Edw. I. i. anno 1276). Whether this was the first general valuation of all the lands of Scotland is not known; but it is certain that the valuation here spoken of was long known as *the old extent*. As such, it is spoken of in the act or indenture of 1326, July 15, by which the parliament of Scotland agreed to give to King Robert Bruce the tenth penny of all the rents of the laity during his life. See VALUATIONS OF LAND.—**SYN.** of 'extend': to increase; expand; widen; dilate; distend; stretch.

EXTENDANT, a.: in *her.*, the same as Displayed; having the wings expanded.

EXTEN'SION, in *Logic*: number of the objects which a term includes; contrasted with **COMPREHENSION**: the two mutually explain each other. A general notion is said to be extensive according to the extent of its application, or the number of objects included under it. Thus *Figure* is a term of very great extension, because it contains in its compass many varieties, such as round, square, oblong, polygonal, etc. In like manner *European* is more extensive than *German*, man than *European*, animal than *man*,

EXTENUATE—EXTERIOR.

organized being than animal. The highest genera are formed by taking in a wider range of objects. Matter and Mind are the most extensive classes that we can form. For, though a higher genus is sometimes spoken of, viz: Existence, it is maintained that to call this a class is to generalize beyond real knowledge, which does not begin till we have at least two actual things to contrast with each other. It is said that that which can be contrasted only with non-existence, nonentity, or nothingness, gives no genuine knowledge: no property can be affirmed of it apart from the thing itself; this is by some deemed open to question. Matter, in its contrast to mind, is a real cognition; and *vice versâ*, mind in its contrast to matter. These, then, on the above principle, are the most extensive terms that have any real knowledge attached to them. But this property of extension is gained by dropping more and more of the peculiarities of the included individuals; 'organized being,' in order to include both plants and animals, must drop from its signification what is peculiar to each, and mean only what is common to both. In short, these very extensive notions have a very *narrow* signification; it is the less extensive that have most meaning. The meaning of 'Man,' or the number of attributes implied in this generic expression, is large. Everything that goes to a human being—the human form and organization, the mental attributes of reason, speech, etc.—is expressed by this term, which is on that account said to be more COMPREHENSIVE than animal or organized being. Thus it may be seen that the greater the extension, the less is the comprehension; and the greater the comprehension, the less is the extension. An individual-name is the term of greatest comprehension, and of least extension. 'Socrates' comprehends all that is common to men and to philosophers, together with all that is peculiar to himself. On the logical uses of this distinction, see Sir W. Hamilton's *Lectures on Logic*, i. 140.

EXTENUATE, v. *ěks-tě'n'ũ-āt* [L. *extěnnũtus*, made very thin—from *ex*, out of; *tenũtus*, made thin: It. *estenuare*: F. *extěnnuer*]: to lessen; to diminish; to palliate, as a fault or crime; to mitigate. EXTEN'UATING, imp.: ADJ. lessening; diminishing. EXTEN'UATED, pp. EXTEN'UA'TINGLY, ad. -*lĩ*. EXTEN'UATOR, n. -*těr*, one who. EXTEN'UA'TION, -*ũ'shũn* [F.—L.]: the act of representing any fault or crime less than it is; palliation. EXTEN'UA'TORY, a. -*těr-ĩ*, that extenuates or palliates.—SYN. of 'extenuate': to palliate; hide; cover; conceal.

EXTERIOR, a. *ěks-tě'r'ĩ-ěr* [OF. *exterieur*, the exterior—from L. *exteriõrem*, outer—from *extěrũs*, on the outside, strange]: outward; external; relating to the outside or outer surface: N. the outward surface; that which is external. EXTE'RIOR'ITY, n. -*õr'ĩ-tĩ*, the quality of being exterior; outwardness; surface. EXTE'RIORLY, ad. -*ěr-lĩ*, externally. EXTE'RIORS, n. plu. -*ěrz*, outward parts of a thing; external deportment or forms. EXTERIOR SLOPE, in *mĩl.*, the surface of the parapet which faces the ditch.—SYN. of 'ex-

EXTERMINATE—EXTINGUISH.

terior, a.': external; outward; extraneous; extrinsic; foreign; outside.

EXTERMINATE, v. *ěks-těr'mě-nūt* [L. *extermīnātus*, driven out or away—from *ex*, out of; *terminus*, a limit: F. *exterminer*, to put an end to]: to destroy utterly; to root out; to eradicate. **EXTERMINATING**, imp.: **ADJ.** destroying utterly; eradicating. **EXTERMINATED**, pp.: **ADJ.** utterly destroyed; eradicated. **EXTERMINATOR**, n. *-těr*, he or that which exterminates. **EXTERMINATION**, n. *-nā'shūn* [F.—L.]: total destruction; eradication. **EXTERMINATIVE**, n. *-nā'tiv*, that exterminates or utterly destroys. **EXTERMINATORY**, a. *-těr-ì*, tending or serving to destroy totally. **EXTERMINE**, v. *-mēn*, in *OE.*, to exterminate; to destroy utterly. **EXTERMINING**, imp. **EXTERMINED**, pp. *-mīnd*.

EXTERNAL, a. *ěks-těr'nāl* [L. *externus*, outward: It. *esterno*: F. *externe*]: outward; not within; visible; foreign. **EXTERNALS**, n. plu. *-nālz*, the outward parts; outward forms or rites. **EXTERNALLY**, ad. *-lī*. **EXTERNALITY**, n. *nāl'ī-tī*, state of being external. **EXTERN**, a. *ěks-těr-n'*, in *OE.*, outward; visible; coming from without: N. a student or pupil who does not reside within a college or seminary; a day scholar in Rom. Cath. schools.

EXTRANEAN, a. *ěx-těr-rā'nē-ūs* [L. *extraneus*; *ex*, out, away; *terra*, earth or land]: belonging to or coming from abroad; foreign.

EXTRITORIAL, a. *ěks-těr-rī-tō'rī-āl* [prefix *ex*; Eng. *territorial*]: beyond the jurisdiction of the laws of the country in which one resides.

EXTRITORIALITY, n. *ěks-těr-rī-tō-rī-āl'ī-tī* [L. *ex*, out of, and Eng. *territory*]: in *diplomacy*, the right possessed by the representatives of foreign powers to live in the country to which they are accredited under the laws of the country to which they belong.

EXTINCT, a. *ěks-tīngkt'* [L. *extinctus*, put out, quenched (see **EXTINGUISH**): quenched; put out; being at an end; no longer existing. **EXTINCTION**, n. *-tīngk'shūn* [F.—L.]: the act of putting out; the state of being quenched or suppressed. **EXTINCTED**, a. *-tīngk'tēd*, in *OE.*, extinguished.

EXTINE, n. *ěks'tīn* [L. *exter*, on the outside]: in *bot.*, the outer covering of the pollen-grain; primine.

EXTINGUISH, v. *ěks-tīng'gwīsh* [L. *extinguēre*, to put out, to quench—from *ex*, out or; *stinguo*, I put out, I quench: F. *éteindre*; OF. *esteindre*, to put out fire: comp. Gael. *teine*, fire]: to put out; to destroy; to suppress; to put an end to. **EXTINGUISHING**, imp. **EXTINGUISHED**, pp. *-gwīsh't*, put out; quenched; suppressed. **EXTINGUISHER**, n. he or that which extinguishes; that which puts out a candle. **EXTINGUISHABLE**, a. *-ā-bl*, that may be quenched or suppressed. **EXTINGUISHMENT**, n. *-mēnt*, the act of suppressing, destroying, putting an end to, or abolishing; extinction, destruction, abolition; the state or condition of being utterly destroyed, exterminated or suppressed; extinction, destruction; in *law*, the extinction or

EXTIRPATE—EXTRA.

ending of an estate, right, etc., by means of merging or consolidating it with another, generally one more extensive.

EXTIRPATE, v. *ěks-těr'pāt* [L. *extirpātus*, plucked up by the stem or root—from *ex*, out of; *stirps*, a root: It. *estirpare*: F. *extirper*]: to root out; to destroy wholly; to remove completely; to exterminate. **EXTIRPATING**, imp. **EXTIRPATED**, pp.: **ADJ.** rooted out; totally destroyed. **EXTIRPATOR**, n. *-těr*, one who, or the thing which. **EXTIRPABLE**, a. *-pǎ-bl*, that may be rooted out. **EXTIRPATION**, n. *-pǎ shùn* [F.—L.]: total destruction; the act of rooting out. **EXTIRPATORY**, a. *-pǎ-těr-ĭ*, that roots out or destroys. **EXTIRP**, v. *ěks-těr'p*, in *OE.*, to root out; to eradicate. **EXTIRPING**, imp. **EXTIRPED**, pp. *-těrpt'*.—**SYN.** of 'extirpate': to eradicate; destroy; root out; pull up; pluck up; expel.

EXTOL, v. *ěks-tòl* [L. *extollĕre*, to raise up or elevate—from *ex*, out of; *tollo*, I raise: It. *estollere*]: to praise highly; to laud; to celebrate in words. **EXTOLING**, imp. **EXTOLLED**, pp. *-tòld'*. **EXTOLLER**, n. one who.—**SYN.** of 'extol': to praise; applaud; magnify; commend; laud; glorify; approve.

EXTORT, v. *ěks-tòrt'* [L. *extortus*, twisted or wrenched out—from *ex*, out of; *tortus*, turned about, twisted: F. *extorquer*]: to wrest or wring from; to draw from by force; to gain from by violence, threats, or injustice: **ADJ.** in *OE.*, extorted. **EXTORTING**, imp. **EXTORTED**, pp. drawn from by compulsion. **EXTORSIVE**, a. *-tòr'siv*, tending to draw from by compulsion. **EXTORTER**, n. one who. **EXTORTIONER**, n. *-tòr'shùn-ěr*, one who practices extortion. **EXTORTION**, n. *-shùn* [OF. *extortion*—L.]: the act or practice of wresting from; oppressive exaction; rapacity—generally said of money. **EXTORTIONARY**, a. *-ěr-ĭ*, practicing extortion. **EXTORTIONATE**, a. oppressive. **EXTORTIONIST**, n. one who.

EXTRA, *ěks-trǎ* [L. *extra*, on the outside, without]: a common prefix, denoting 'above or beyond usual'; in excess; additional; out of. **EXTRA-PAROCHIAL**, beyond the limits of any parish. **EXTRA-JUDICIAL**, out of ordinary court procedure. **EXTRA**, a. beyond what is usual, or has been agreed upon; additional, as *extra* work, *extra* hours, *extra* quantity. **EXTRAS**, n. plu. *-trās*, things in addition to what is due or expected. **EXTRA-AXILLARY**, *-ǎks'ĭl-ěr ĭ*, in *bot.*, removed from the axil of the leaf, as in the case of some buds. **EXTRA-BELIEF**, n. Matthew Arnold's rendering of the German *Aberglaube*, which he does not consider adequately translated by the word superstition. **EXTRA-CONSTELLARY**, a. *-kòn-stèl'ler-ĭ* [prefix *extra*; Eng. *constellary*]: in *astron.*, term applied to stars not classed under any constellation. **EXTRA-DOTAL**, a. *-dò'tal*, not belonging to dower; as, *extradotal* property. **EXTRA-FOLIACEOUS**, a. *ěks-tra-fò-lĭ-ā shūs*, in *bot.*, beyond a leaf; away from the leaves or inserted in a different place from them. **EXTRA-MUNDANE**, *-mũn'dān* [L. *mundus*, the world]: beyond the limits of the material world. **EXTRA-MURAL**, *-mũ'rǎl* [L. *murus*, a wall]: without or beyond the walls, as of a fortified city,

EXTRACT—EXTRACTION OF ROOTS.

or of a university. **EXTRA-PROFESSIONAL**, not within the usual limits of professional business or habits. **EXTRA-PROVINCIAL**, a. *-prô-vîn'shal*, out of or beyond the limits of the same province or jurisdiction: not under the jurisdiction of the same archbishop. **EXTRA-REGULAR**, a. *-rêg'û-lar*, out of rule; beyond ordinary rules. **EXTRA-TERRITORIALITY**, n. *-têr-rî-tô-rî-âl'i-tî*, immunity from a country's laws like that enjoyed by an ambassador. **EXTRA-VASCULAR**, a. *vâs'kû-lar*, being out of the proper vessels. *Note*.—When **EXTRA** is employed as a prefix, a hyphen is usually placed between it and the word.

EXTRACT, v. *êks-trăkt'* [*L. extractus*, drawn out or forth—from *ex*, out of; *tractus*, drawn or dragged]: to draw out; to take out or from; to select: N. *êks'trăkt*, that which is drawn out or from something else; a selection, as from a book; a tincture evaporated to a paste; a decoction; in *OE.*, descent. **EXTRACTING**, imp. *-trăk'ting*. **EXTRACTED**, pp.: **ADJ.** drawn or taken out. **EXTRACTIBLE**, a. *-tî-bl*, that may be extracted. **EXTRACTOR**, n. *-têr*, that which extracts. **EXTRACTION**, n. *-shûn* [*F.—L.*]: the act of drawing out or from; birth; lineage; descent. **EXTRACTIVE**, a. *-tîv*, that may be extracted; term applied to certain organic matters resembling humine, found in soils during decay of vegetable matter, and precipitated during the concentration of water solutions. **EXTRACTUM CARNIS**, *êks-trăk'tiûm kâr'nîs* [*L. extract of flesh*], or **EXTRACT OF MEAT**, obtained by acting on chopped meat by cold water, and gradually heating, when about one-eighth of the weight of the meat dissolves out, leaving an almost tasteless insoluble fibrine. The extract of meat contains the salts and savory constituents of the meat, and is a light and stimulating article of food: see **BEEF-TEA: BROTH**. It may be concentrated into small bulk, and when desired, may be afterward treated with water, and being heated, forms an agreeable light soup, though rather stimulating than nutritious: see **PRESERVES**.

EXTRACTION OF ROOTS: process in mathematics: see **EVOLUTION**. The roots which have in practice to be most frequently extracted are the *square* and *cube* roots. It is proposed to explain the rule for their extraction as it is given in books of arithmetic. And first of the square root. The square of $a + b$ is $a^2 + 2ab + b^2$, and we may obtain the rule by observing how $a + b$ may be deduced from it. Arranging the expression according to powers of some letter a , we observe that the square root of the first term is a .

$$\begin{array}{r} a^2 + 2ab + b^2(a + b) \\ a^2 \hline 2a + b) \quad \quad 2ab + b^2 \\ \quad \quad 2ab + b^2 \hline \end{array}$$

Subtract its square from the expression and the remainder is $2ab + b^2$. Divide $2ab$ by $2a$, and the result is b , the other term in the root. Multiply $2a + b$ by b , and subtract the product from the remainder. If the operation does

EXTRACTION OF ROOTS.

not terminate, it shows that there is another term in the root. In this case we may consider the the two terms $a + b$ already found as one; and as corresponding to the term a in the preceding operation; and the square of this quantity having been by the preceding subtracted from the given expression, we may divide the remainder by $2(a + b)$ for the next term in the root, and for a new subtrahend multiply $2(a + b) +$ the new term, by the new term; and the process may be repeated till there is no remainder. The rule for extracting the square root of a number is an adaptation of this algebraic rule. In fact, if the number be expressed in terms of the radix of its scale, it is seen to be a concealed algebraical expression of the order we have been considering. Thus, $N = ar^m + br^{m-1} . . . + q$. The number 576 in the denary scale may be written $5 \times 10^2 + 7 \times 10 + 6$; and treating it as an algebraical expression, we should find its root to be $2 \times 10 + 4$, or 24. The only part of the arithmetical rule now requiring explanation is the rule of pointing. As every number of one figure is less than 10, its square must be less than 10^2 ; generally, every number of n figures is less than 10^n (which is 1 followed by n ciphers); but also every number of n figures is not less than 10^{n-1} , and therefore its square is not less than 10^{2n-2} —which is the smallest number of $2n - 1$ figures. Also, 10^{2n} is the smallest number of $2n + 1$ figures. It follows that the square of a number of n figures has either $2n$ or $2n - 1$ figures. If, then, we put a point over the units place of a number of which the root is to be extracted, and point every second figure from right to left, the number of points will always equal that of the figures in the root. If the number of figures be even, the number will be divided into groups of two each; if odd, the last group will contain only a single figure.

¶ The rule for the extraction of the cube root of a number is deduced from that for the extraction of the cube root of an algebraical expression in the same way as in the case of the square root. The cube of $(a + b)$ is

$$\begin{array}{r} a^3 + 3a^2b + 3ab^2 + b^3(a + b) \\ a^3 \\ \hline 3a^2) \quad 3a^2b + 3ab^2 + b^3 \\ \quad 3a^2b + 3ab^2 + b^3 \\ \hline \end{array}$$

Hence the rule in algebra. Arrange the expression according to descending powers of a , the cube root of the first term a^3 is a , the first term of the root. Subtract its cube from the expression, and bring down the remainder. Divide the first term by $3a^2$, and the quotient is b , the second term of the root. Subtract the quantity $3a^2b + 3ab^2 + b^3$. If there is no remainder, the root is extracted. If there is, proceed as before, regarding $a + b$ as one term, corresponding to a in the first operation. Let, for example, $a + b = a^1$, then $3a^{1^2}$ is the new trial divisor. If c be the new term or third figure of the root, then the quantity to be subtracted to get the next remainder is $3a^{1^2}c + 3a^1c^2 + c^3$, and so on till there is no remainder. The rule of pointing in the extraction of the cube root may be proved, as in the

EXTRACTS—EXTRADITION.

case of the square root, by showing that the cube of a number of n figures contains $3n$, $3n - 1$, or $3n - 2$ figures; and, therefore, if we put a point over the units place, and on each third figure, we shall have as many periods as there are figures in the root.

A rule for the extraction of any root of a number may be got from considering how, from the expansion of $a + b$ to the n th power, or $a^n + na^{n-1}b +$, etc., the root $a + b$ is to be obtained: see EVOLUTION and INVOLUTION.

EXTRACTS, in Medical Usage: preparations of vegetable principles, got either by putting the plants in a solvent or menstruum, and then evaporating the liquid down to about the consistency of honey, or by expressing the juice of the plants and evaporating; this last is properly *inspissated juice*. Extracts, therefore, contain only those vegetable principles that are either held in solution in the juices of the plants themselves, or are soluble in the liquid employed in extracting them, and at the same time are not so volatile as to be lost during evaporation. Now, as many extractive matters are more or less volatile, it makes a great difference whether the operation is conducted at a low or at a high temperature. Extracts are called *watery* or *alcoholic* according as the menstruum employed is water or spirits. Ether also is used in extracting. Different plants afford different extracts, some being of the nature of bitters, others being used as pigments, tannin, etc. Extracts are liable to great uncertainty in point of strength and composition, and require to be prepared with great care. Evaporation in vacuo is found to be a great improvement.

EXTRADITION, *n.* *ěks'tră-dish'ăn* [F. *extradition*—from L. *extraditiōnem*—from *ex*, out of; *tradiō*, a delivering up, a surrender]: the delivering up by one government to another of any subject who has fled from justice. EXTRADITE, *v.* *ěks'tră-dīt*, to deliver up to one country by another, a subject of the former who is a fugitive from justice, generally according to treaty and under certain formalities. EX'TRADITING, *imp.* EX'TRADITED, *pp.* *-dī-těd*:—*Extradition* is always the subject of international treaty. A treaty or convention for this purpose was entered into between the United States and Great Britain 1842, and between Great Britain and France 1843. The crimes for which extradition from Great Britain is allowed were settled by the Extradition Act 1870, 33 and 34 Vict. c. 52, and include murder, manslaughter, spurious coining, forgery, larceny, false pretenses, bankruptcy offenses, rape, abduction, child-stealing, burglary, arson, robbery, threats to extort money, sinking of ships, revolt and assaults in ships; but there is no surrender if the offense is one of a political character. The surrender is effected through the intervention of the sec. of state, and it is by the secretary's warrant that the alleged criminal is finally handed over with the depositions to the foreign state making the requisition.

The practice of the United States government both as to demanding from, and surrendering fugitive criminals to,

EXTRADOS—EXTRAORDINARY.

foreign governments is regulated entirely by treaty. The first general law on the subject was enacted by congress 1848, and recognizes this principle. The separate American states have no power to surrender fugitive criminals at the demand of a foreign government. They may and do surrender such criminals to each other. Many treaties have been made by the United States with foreign governments at different times, notably with Great Britain, 1842; France, 1843, 45, 58; Hawaiian Islands, 1849; Swiss Confederation, 1850; Prussia, 1852; Bremen, 1853; Bavaria, 1853; Wurtemberg, 1853; Mecklenburg-Schwerin, 1853; Mecklenburg-Strelitz, 1853; Oldenburg, 1853; Schaumburg-Lippe, 1854; Hanover, 1855; Two Sicilies, 1855; Austria, 1856; Baden, 1857; Sweden and Norway, 1860; Venezuela, 1860; Mexico, 1861; Hayti, 1864; Dominion Republic, 1867; Italy, 1868, 69; Nicaragua, 1870; Orange Free State, 1871; Ecuador, 1872. Treaty stipulations have been made also with Republic of Salvador, 1870; Peru, 1870; Ottoman Empire, 1874; Spain, 1877; Netherlands, 1880; Belgium, 1882. The extraditable crimes usually specified are: arson, assassination, assault with intent to commit murder, burglary, circulation or fabrication of counterfeit money; counterfeiting public bonds, bank bills, securities, stamps, dies, seals, and marks of state and administrative authority; embezzlement of public money, embezzlement by public officers, embezzlement by persons hired or salaried, utterance of forged paper, forgery, infanticide, kidnapping, larceny, murder, mutiny, mutilation, parricide, piracy, poisoning, rape, and robbery. Some treaties also include bigamy, fraudulent bankruptcy, fraudulent barratry, and intentional injuries to railroads and telegraph lines (Spear on *Extradition*).

EXTRADOS, n. *ěks-tră'dôs* [F. *extrados*—from L. *extra*, on the outside, and F. *dos*; L. *dorsum*, the back]: the exterior curve of an arch. **EXTRA'DOSED**, a. *-tră'döst*, in *arch.*, term applied to an arch when the curves of the intrados and extrados are concentric and parallel.

EXTRA-JUDICIAL, **EXTRA-MUNDANE**, **EXTRA-MURAL**, etc.: see under **EXTRA**.

EXTRANEOUS, a. *ěks-tră'ně-üs* [L. *extrăněüs*, external, outward—from *extra*, without]: foreign; not belonging to a thing; without or beyond a thing. **EXTRA'NEOUSLY**, ad. *-lě*. **EXTRANEITY**, n. *ěks-tră-ně'i-tě*, state of being foreign; state of being without or beyond a thing. **EXTRANEOUS MODULATION**, n. *möd-ü-lă'shün*, in *mus.*, modulation to an extreme or unrelated key.

EXTRAORDINARY, a. *ěks-trör'dě-něr-ě* or *ěks-tră-ör'-dě-něr-ě* [F. *extraordinaire*—from L. *extrăördinăriüs*, out of the common order—from *extra*, beyond; *ordo*, arrangement, order: It. *extraordinario*]: beyond ordinary or usual; uncommon; remarkable; special. **EXTRAOR'DINARILY**, ad. *-něr-ě-lě*, in a manner out of the common method and order; remarkably; in an uncommon degree. **EXTRAOR'DINARIES**, n. plu. *-něr-ěz*, unusual things.

EXTRAUGHT—EXTREME.

EXTRAUGHT, v. *ěks-trawt'*: in *OE.*, the old pp. of *extract*; extracted; sprung from; descended.

EXTRAVAGANT, a. *ěks-tráv'ă-gánt* [F. *extravagant*—from L. *extravāgāntem*—from L. *extra*, without or beyond; *vagans*, wandering—*lit.*, wandering out of proper bounds]: excessive; wasteful; unreasonable; vainly expensive; not within ordinary limits of truth or probability. **EXTRAVAGANTLY**, ad. *-lĭ*. **EXTRAVAGANCE**, n. *-gāns* [F.—L.]: excess in anything; a going beyond the limits of strict truth or probability; also **EXTRAVAGANCY**, n. *-sĭ*. **EXTRAVAGANTS**, n. plu. certain decretal epistles or constitutions of the popes. **EXTRAVAGANZA**, n. *-gān'ză* [It.]: an unusual or irregular piece of music; a burlesque on the stage. **EXTRAVAGANZIST**, n. *-zĭst*, extravagant or eccentric person; writer of extravaganzas.—**SYN.** of 'extravagance': excess; prodigality; wildness; irregularity; profusion; waste; dissipation; outrage; violence; bombast;—of 'extravagant': prodigal; lavish; profuse; irregular; unrestrained; wild; uncontrolled.

EXTRAVASATE, v. *ěks-tráv'ă-săt* [F. *extravaser*—from L. *extra*, without, and *vas*, any kind of vessel]: to let or flow out of the proper vessels, as blood out of veins. **EXTRAVASATING**, imp. **EXTRAVASATED**, pp.: **ADJ.** forced out of the arteries, veins, etc., as the blood by which the skin, is discolored in bruises. **EXTRAVASATION**, n. *să-shŭn* [F.—L.]: the act of flowing out of the proper ducts or vessels, through ruptures or injuries in their walls, as blood or any fluids of the living body, into the surrounding tissues; the effusion of the blood after the rupture of a vessel. Excrementitious matter thus sometimes escapes into the abdomen through a wound or ulceration of the bowels. But the term is oftenest used in speaking of the escape of blood from injured blood-vessels, Extravasation is distinguished from exudation by this, that in the last the vessels remain entire, and the effusion takes place by filtration through their walls; nor does more than a part of the blood so escape, the blood globules being retained, while in extravasation perfect blood is effused. Many kinds of extravasation are immediately fatal, such as that of urine or of gall into the abdomen, or of blood from the vessels of the brain in many cases of apoplexy. The dark color resulting from a bruise is owing to extravasated blood from ruptured capillary vessels.

EXTREAT, n. *ěks-trēt'* [Norm. F. *estraite*]: in *OE.*, extraction.

EXTREME, a. *ěks-trēm'* [F. *extrême*—from L. *extrēmus*, the outermost, last: It. *estremo*]: furthest; outermost; utmost; most violent; highest in degree; most pressing; rigorous; strict: N. that part which terminates; utmost point. **EXTREMES**, n. plu. *-trēmz'*, what are furthest distant from each other. **EXTREMELY**, ad. *-lĭ*. **EXTREMITY**, n. *-trēm'ĭ tĭ* [F. *extrémité*]: the utmost point; the verge; the greatest rigor or violence; necessity; the utmost distress. **EXTREMITIES**, n. plu. *-tĭz*, the parts most remote from the middle; limbs as opposed to the trunk or head. **EXTREME**

EXTREME UNCTION—EXTRICATE.

UNCTION: see **UNCTION**.—**SYN.** of 'extremity': border, extreme; termination; close; end; limit.

EXTREME UNCTION [see **UNCTION**]: sacrament of the Rom. Cath. Church, which, as the other sacraments supply spiritual aid in the various circumstances of life, is believed to impart to the Christian in death grace and strength to encounter the struggle, as well spiritual as bodily, of the dying hour. The rite of unction in different forms is common to several of the sacraments; the name 'extreme' given to that of the present sacrament, denotes that it is reserved for the last act of the Christian career. The council of Trent declares this sacrament, though 'promulgated' in the well known passage of St. James, v. 14, 15 (which Protestants regard as having more to do with the general belief in the sanative properties of oil), to have been 'instituted' by Christ. The Fathers frequently allude to the rite of unction, and though many of these allusions certainly refer to the unctions of baptism and confirmation, yet Rom. Catholics rely on several passages of Origen, Chrysostom, Cæsarius of Arles, and Pope Innocent I., as decisive regarding the unction of the dying, as also upon the fact that in the various separated churches of Oriental Christians—Greek, Coptic, Armenian, and Nestorian—the rite is found, though with many ceremonial variations. In the Rom. Cath. Church, the sacrament is administered by the priest, who, 'dipping his thumb in the holy oil, anoints the sick person, in the form of the cross, upon the eyes, ears, nose, mouth, hands, and feet; at each anointing making use of this form of prayer: "Through this holy unction, and his most tender mercy, may the Lord pardon thee whatever sins thou hast committed by thy sight. Amen." And so of the hearing and the rest, adapting the form to the several senses.'—Challoner's *Catholic Christian Instructed*. E. U. is reputed by Catholics one of the sacraments 'of the living;' that is, it ordinarily requires that the recipient should have previously obtained remission of his sins by absolution or by perfect contrition; but it is held to remit, *indirectly*, actual sins not previously remitted, and also (though not infallibly, but according to the merciful designs of Providence) to alleviate, and even to dispel, the pains of bodily disease. The holy oil which forms the 'matter' of this sacrament must be blessed by the bishop—a ceremony performed with great solemnity once each year by the bishop, attended by a number of priests, on Maundy-Thursday. In the Greek Church, the sacrament is administered by several priests conjointly. In its most solemn form, seven priests unite in its administration; in ordinary circumstances, it is conferred by two. The Greek form of words differs, though not substantially, from that of the Latin Church. The Greeks call this sacrament 'The Holy Oil,' and sometimes 'The Oil of Prayer.'

EXTRICATE, v. *ěks'trĭ-kăt* [L. *extricātus*, disentangled—from *ex*, out of; *trĭcæ*, trifles, hindrances]: to free from difficulties or perplexities; to disentangle; to set free. **Ex-TRICATING**, imp. **Ex'TRICATED**, pp. **Ex'TRICABLE**, a. *-kă-bl*,

EXTRINSIC—EXULT.

that may be extricated. EX'TRICABLY, ad. -bl̃. EX-TRICA'TION, n. -kǎ'shŭn, a freeing from perplexities; disentanglement.—SYN. of 'extricate': to disengage; relieve; set free; disembarass; evolve.

EXTRINSIC, a. ěks-trĭn'sĭk, or EXTRIN'SICAL, a. -sĭ-kǎl [OF. *extrinseque*, outward—from L. *extrinsecus*, from without, on the outside—from *exter*, outward; *secus*, by, beside, or simply 'side': F. *extrinsèque*]: without, but yet near to; external; outward; not contained in or belonging to a body. EXTRIN'SICALLY, ad. -lĭ.

EXTORSE, a. ěks-trōrs', or EXTROR'SAL, a. -trōr'sǎl [L. *extra*, on the outside; *orsus*, beginning, commencing]: in bot., applied to anthers in which the slit through which the pollen escapes is toward the outside of the flower, and not, as usual, toward the pistil.

EXTROVERSION, n. ěks-trō-vēr'shŭn [L. *extra*, beyond, without; *versio*, a turning]: in surg., turning of an organ inside out; as, for example, the bladder.

EXTRUDE, v. ěks-tród' [L. *extrūdĕrĕ*, to thrust out—from *ex*, out of; *trūdo*, I thrust: It. *estrudere*]: to thrust out; to expel; to force or press out. EXTRU'DING, imp. EXTRU'DED, pp. EXTRU'SION, n. trō'zhŭn [L. *extrūsūs*, thrust out]: the act of thrusting or driving out; expulsion.

EXUBERANT, a. ěks-ŭ'ber-ǎnt [F. *exubérant*; L. *exŭbĕran'tem*, being in great abundance—from *ex*, out of; *ŭbĕr*, fruitful, fertile: It. *esuberantĕ*]: plenteous in a high degree; luxuriant; over-abundant. EXŬBERANTLY, ad. -lĭ. EXŬBERANCE, n. ǎns [F.—L.]: or EXŬBERANCY, n. -ǎn-sĭ, an overflowing quantity; superfluous abundance; richness; luxuriance.—SYN. of 'exuberance': excess; abundance; plenty; copiousness; rankness; overflow; overgrowth; wantonness; superfluity.

EXUCONTIANS, n. ěks-ŭ-kōn'shĭ-anz [Gr. *exoukontōn*, from persons or things not existing]: Arian sect which arose in the 4th c. They held that Christ might indeed be called God, and the Word of God, but only in a sense consistent with his having been brought forth from non-existences, that is, that there was a time when he did not exist, and that consequently he was but a creature.

EXUDE, v. ěks-ŭd' [L. *exŭdāre*, to sweat out—from *ex*, out of; *sūdo*, I sweat]: to discharge the moisture or juices of an animal or a plant through its skin or surface; to flow from a living body through an opening or incision. EXŬDING, imp. EXŬDED, pp. EX'UDA'TION, n. -ŭ-dǎ'shŭn, a discharge of moisture from animal bodies or from plants; that which has been exuded.

EXULT, v. ěgz-ŭlt' [L. *exultāre*, to leap and frisk about—from *ex*, out of; *saltāre*, to leap or dance: It. *esultare*]: to leap or dance, as for joy; to rejoice exceedingly; to be glad above measure; to triumph. EXULT'ING, imp.: ADJ. rejoicing greatly. EXULT'ED, pp. EX'ULTA'TION, n. -ŭl-tǎ'shŭn [F.—L.]: the act or state of rejoicing greatly; great gladness; triumph. EXUL'TANT, a. -tǎnt, rejoicing triumphantly. EXUL'TINGLY, ad. -lĭ.

EXUMAS—EYAS.

EXUMAS, *ěks-ô'máz*: comprising great Exuma, Little Exuma, and the Exuma Keys; part of the group of the Bahama Islands. The inhabitants are employed partly in agriculture, including at one time the growing of cotton, but chiefly in salt-making, in which the E. rank second among all the subdivisions of the group. They have exported as much as 116,000 bushels of salt a year. Next to Nassau in New Providence, Little Exuma is the most considerable port of entry in the Bahamas. Pop. of the group, abt. 2,000.

EXUSTION, n. *ěks-úst'yŭn* [L. *exustionem*, a consuming by fire—from *ex*, out of; *ustus*, burnt]: the act of burning or consuming by fire.

EXUTORY, n. *ěgz-ŭ'tě-rĭ* [L. *exutus*, pp. of *exuo*, I lay or put off]: in *méd.*, an issue; small ulcer produced artificially, and kept open for therapeutic purposes.

EXUVIÆ, n. plu. *ěgz-ŭ'vĭ-ě* [L. *exuviae*, things laid aside or taken off from the body]: things of any kind cast off and left; cast-off skins, shells, etc., of animals; in *geol.*, formerly all fossil animal matter or fragments of animals of any description, now seldom used in this sense. **EXU'VIABLE**, a. *-ă-bl*, that may be cast or thrown off. **EXU'VIA'TION**, n. *-ă-shŭn*, the process by which animals, such as the crustaceans, serpents, etc., throw off their old coverings and assume new ones. **EXUTIVE**, a. *ěks ŭ-tĭv*, in *bot.*, applied to seeds wanting the usual integumentary coverings.

EX VOTO, n. *ěks vŏ'tŏ* [L. from, or in accordance with a vow]: something offered to some divinity either in gratitude for an exemplary favor, or to obtain such benefit. Roman *ex votos* consisted usually of paintings representing the particular danger from which the person had been delivered. Pictorial *ex votos* are common in Rom. Cath. churches in Europe, and as they are not of a high order of art, it is usual in the slang of the *ateliers*, to call a daub an *ex voto*. In the 5th c. it had become usual to offer gold and silver eyes to the saints in the churches, in acknowledgment of cures; and *ex votos* in the shape of pictures, models of diseased or wasted limbs, and even walking sticks and crutches may be seen suspended near the altars of the Virgin and the saints in many churches, notably at Notre Dame des Victoires, in Paris, and at Lourdes.

EYALET, *ă'yă-lět*, or **VILAYET**, *vĕ-lă-yět'*: largest and most important class of the administrative divisions of the Turkish empire, formerly known as pashalics. These are again divided into *livas* or *sanjaks*, the *livas* into *cazas* or districts, and the *cazas* into *nahiés* or communes, containing villages and hamlets. Each eyalet or general government, as it may be called, is administered by a pasha, who is governor, and the general name for whom is *vali* or viceroy. The governors of the eyalets belong to the Dignities of the Sword, and are pashas of two tails; and when they are raised to the rank of vizier, as is frequently the case, they become pashas of three tails.

EYAS, n. *ĭ'ăs*: see under **EYRIE**.

EYCK.

EYCK, *ik*, HUBERT VAN: illustrious painter of the old Flemish school: abt. 1366–1426, Sep. 18; b. Maas-Eyck. Hubert, with his younger brother and pupil, Jan, resided chiefly at Bruges and Ghent, and they became the founders of the Flemish school of painting. Hubert is among the greatest names of the 15th c. in ecclesiastical art; certainly the greatest outside of Italy. Though lacking in scientific perspective, he commands admiration by his vigor of conception, his careful finish, and his clearness and richness of color. The honor of being the inventor of oil-painting is claimed for him, though sufficient evidence has been adduced to show that it was practiced previously. Before his time, the custom, however, particularly in Italy, was to paint with gums or other substances of an adhesive nature dissolved in water; and if not the inventors, the brothers were at least the first who brought into notice and perfected the mode of mixing colors with oil or some medium of which oil was the chief ingredient; while, for transparent and brilliant coloring and minute finish, their works have never been surpassed. Till the death of Hubert, the brothers generally painted in conjunction: one of their most important works was an altar-piece with folding-doors, representing the Elders adoring the Lamb—a subject from the Apocalypse—painted for *Jodocus Vyts*, who presented it to the cathedral of St. Bavon, in Ghent. The two central divisions of this picture are all that remain in the church at Ghent. Some of the wings are in the Gallery at Berlin. The master-pieces of the brothers are for the most part in the cities of Ghent, Bruges, Antwerp, Berlin, Munich, and Paris. See **EYCK, JAN VAN.**

EYCK, JAN VAN: illustrious painter of the old Flemish school: b. Maas-Eyck, 1370 (as some suppose, though Kugler—usually good authority on ancient art—dates his birth 1400); d. Bruges 1440–1; brother of Hubert. Jan, who had the advantage of his brother's teaching and experience, and besides had sojourned in sunnier southern lands, left work which cannot be called inferior to Hubert's—possibly superior in some points of graceful effect, while lacking something of the older brother's spiritual grandeur. In the National Gallery, London, there are three pictures by Jan van E., which, though small, well exemplify the high qualities of his works, and show him able to work fully in the spirit of his brother. These are portraits of a Flemish merchant and his wife, standing in the middle of an apartment, with their hands joined—signed and dated 1434: of the portrait of a man in a cloak and fur-collar, with a red handkerchief twisted around the head as a turban—painted, according to an inscription on the lower part of the frame, 1433, Oct. 21; and portrait of a man with a dark-red dress, with a green head-covering—signed and dated 1432, Oct. 10. Compare Waagen, *Ueber Hub. und Jan van Eyck* (Breslau, 1822); Hotho, *Die Malerschule E.'s* (1858). See **EYCK, HUBERT VAN.**

EYE.

EYE, n. *ī* [AS. *eage*; Icel. *auga*; Goth. *augo*; Ger. *auge*; L. *ocūlus*, the eye]: the organ of sight or vision; sight; view; notice; observation; a small loop or ring; a bud; a very small perforation: V. to watch or keep in view; to watch narrowly. **EYING**, imp. *ī'ing*. **EYED**, pp. *īd*: **ADJ.** having eyes. **EYEN**, or **EYNE**, n. *ī'n*, in *OE.*, eyes; the plu. of *eye*. **EYER**, n. *ī'ēr*, one who. **EYELESS**, a. without eyes. **EYE-BEAM**, n. a beam or glance of the eye. **EYE-BOLT**, n. in *naut.*, bolt having an eye or loop at one end for the reception of a ring, hook, or rope. The insertion of a closed ring into the eye converts it into a ring-bolt. **EYE-CUP**, n. cup for washing the eyeball. Its lip is held firmly against the open lid, and the eye-wash dashed against the ball, or forced against it by compressing the reservoir. **EYE-DROP**, n. a tear. **EYE-FLOP**, n. a blinker on a horse's bridle. **EYE'FUL**, a. filling or attracting the eye; visible; remarkable. **EYE-GLASS**, a single spectacle or prepared disk of glass to assist the sight. **EYE-HEADED**, a. having an eye or aperture in the head. A form of bolt having an eye at the head end; intended for securing together two objects at right-angles. **EYE-HOLE**, n. circular opening in a bar, etc., to receive a pin, hook, rope, or ring. **EYE-SERVANT**, one who works only when watched. **EYE-SERVICE**, service only under the eye of a master. **EYE-STONE**, a name given to those varieties of circle agate which show, in the centre, a spot or spots more highly colored than the concentric layers; name given to a small smooth stone still sometimes used for removal of foreign substances from the eye; it is inserted under the eye-lid, and moving with the motion of the eye, carries out the intruding fragment. **EYE-TOOTH**, one of the two pointed teeth of the upper jaw, one under each eye. **EYE-WITNESS**, one who sees the thing done; one who has seen. **EYEBALL**, the ball or apple of the eye. **EYEBROW**, n. the brow or hairy arch above the eye. **EYELASH**, n. the line of hair that edges the eye-lid. **EYELET**, n. *ī'lēt*, or **EYELET-HOLE** [*F. willet*, a little eye—from *OF. ail*—from L. *ocūlus*, the eye]: a small hole or perforation to receive a lace or cord, also to admit light. **EYELET-PUNCH**, n. device used at the desk for attaching papers together by eyeleting. It has usually a hollow punch for making a hole, and a die-punch to upset the flange of the eyelet. **EYELETEER'**, same as stiletto. **EYELID**, n. the movable cover which opens or closes the eyeball. **EYE-PIECE**, in a *telescope* or *microscope*, the lens or lenses with which the image is viewed and magnified (see **TELESCOPE**). **EYE-RIM**, n. circular single eye-glass, adapted to be held to its place by the construction of the orbital muscles. **EYE-SALVE**, ointment for the eyes. **EYE-SHOT**, a sudden glance of the eye; view. **EYESIGHT**, n. view; observation; the sense of seeing. **EYESORE**, n. something offensive to the sight. **EYE-SPECULUM**, n. instrument for dilating the eye-lids, to expose the exterior portions of the eye and its adjuncts. **EYE-SPLICE**, n. in *naut.*, a splice made by turning the end of a rope back on itself and splicing the end to the standing part, leaving a loop. **EYE-SPOT**, n. a kind of lily of a violet or black color, with a red spot in the middle of each leaf. **EYE-STRINGS**, n. the strings or tendons by which the eye is

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moved. EYED HAWKMOTH, in *entom.*, *Smerinthus ocellatus*; the *sphinx ocellata* of Linnæus: see HAWKMOTH. IN THE EYE OF THE WIND, in the position of direct opposition to it. TO HAVE AN EYE TO, to be on the lookout in a certain direction. TO KEEP AN EYE ON, to observe closely; to watch strictly. UNDER THE EYE, under close inspection or observation. WITH AN EYE TO, looking closely and narrowly towards a thing, particularly with a view to personal advantage. EYLIAD, n. *ī'li-ād* [F. *œillade*, a glance, a leer—from *œil*, the eye]: in *OE.*, a glance of the eye.

EYE, *ī*, (Aug. Sax. *ig.* 'an island'): market town and municipal borough in Suffolk, Engnd., 20 m. n. of Ipswich. It has a fine perpendicular flint-work church (restored 1869), with a tower 101 ft. high, a corn exchange and town hall (1857), a grammar school (restored and enlarged, 1876-82), and a station at the terminus of a short branch railway. Pop. (1881) 2,296.

EYE, ANATOMY AND PHYSIOLOGY OF THE: including:
1. The structure of the human eyeball, and of certain accessory parts or appendages which serve to protect that organ, and are essential to the due performance of its functions. 2. The most striking modifications which this organ presents in some of the lower animals. 3. The special uses of the various parts of the eye considered as an optical instrument. 4. The action of the retina.

1. The *globe of the eye* is placed in the anterior part of the cavity of the Orbit (q. v.), in which it is held in position by its connection with the optic nerve posteriorly, and with the muscles which surround it, and by the eyelids in front. It is further supported behind and on the sides by a quantity of loose fat, which fills up all the interstices of the orbit, and facilitates the various movements of which the eye is capable.

The form of the eyeball is nearly spherical; but on viewing the organ in profile, we see that it is composed of segments of two spheres of different diameters. Of these, the anterior, formed by the transparent cornea, has the smaller diameter, and is therefore the most prominent; and hence the antero-posterior slightly exceeds (by about a line) the transverse diameter. The radius of the posterior or sclerotic segment is about $\frac{1}{10}$ ths, and that of the anterior segment about $\frac{1}{8}$ ths of an inch.

When the eyes are in repose, their antero-posterior axes are parallel; the optic nerves, on the other hand, diverge considerably from their commissure within the cavity of the skull to the point where they enter the globe; consequently, their direction does not coincide with that of the eye. Each nerve enters the back of the globe at a distance of about $\frac{1}{8}$ th of an inch on the inner side of the antero-posterior axis of the eye.

The eyeball is composed of several investing membranes, and of certain transparent structures, which are inclosed within them, and which, together with the cornea (one of the membranes), act as refractive media of various densities upon the rays of light which enter the eye.

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The outermost coat of the eye is the *sclerotic* (from *skleros*, hard). It is a strong, dense, white, fibrous structure, covering about four-fifths of the eyeball, and leaving a circular deficiency anteriorly, which is occupied by the cornea. Posteriorly, it is perforated by the optic nerve, and it is there continuous with the sheath which that nerve derives from the *dura mater*, the fibrous investment of the brain

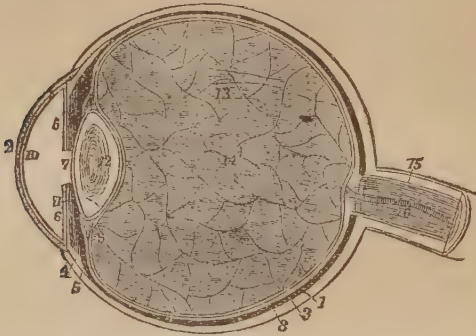


Fig. 1.

A longitudinal section of the coats of the eye.

1, the sclerotic, thicker behind than in front; 2, the cornea; 3, the choroid; 6, the iris; 7, the pupil; 8, the retina; 10, the anterior chamber of the eye; 11, the posterior chamber; 12, the crystalline lens, inclosed in its capsule; 13, the vitreous humor, inclosed in the hyaloid membrane, and in cells formed in its interior by that membrane; 15, the sheath; and 16, the interior of the optic nerve, in the centre of which is a small artery. (The other numbers in the figure refer to parts not noticed in this article.)

and spinal cord. Near the entrance of the nerve, its thickness is about $\frac{1}{20}$ th of an inch; from this it diminishes to about $\frac{1}{30}$ th; but in front it again becomes thicker, from the tendinous insertions of the straight muscles which blend with it. This coat, by its great strength and comparatively unyielding structure, maintains the inclosed parts in their proper form, and serves to protect them from external injuries.

The *cornea* (so called from its horny appearance) is a transparent structure, filling the aperture left in the anterior part of the sclerotic. Its circumference is overlaid by the free edge of the sclerotic, which in some parts presents a groove, so as to retain it more firmly; and the connection by continuity of texture between the two structures is so close, that they cannot be separated in the dead body without considerable maceration.

The cornea, in consequence of its greater convexity, projects beyond the line of the sclerotic; the degree of convexity, however, varies in different persons, and at different periods of life. It is thicker than any part of the sclerotic, and so strong as to be able to resist a force capable of rupturing that tunic.

Although beautifully transparent, and appearing to be homogeneous, it is in reality composed of five layers, clearly

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distinguishable from one another—viz. (proceeding from the front backward) 1. The conjunctival layer of epithelium. It is in this epithelium that particles of iron, stone, etc., forcibly driven against the eye, usually lodge, and it is a highly sensitive membrane. 2. The anterior elastic lamina forming the anterior boundary of the cornea proper; it is not more than $\frac{1}{8000}$ th of an inch in thickness; and its function seems to be that of maintaining the exact curvature of the front of the cornea. 3. The cornea proper, on which mainly the thickness and strength of the cornea depend. 4. The posterior elastic lamina, an extremely thin membrane, in which no structure can be detected. It probably contributes, like the anterior lamina, to the exact maintenance of the curvature of the cornea, so necessary for correct vision. 5. The posterior epithelium of the aqueous humor, probably concerned in the secretion of the fluid.

For further details regarding these different layers, see Tood and Bowman's *Physiological Anatomy*, II. pp. 17-21.

The *choroid coat* is a dark colored vascular membrane, brought into view on the removal of the sclerotic. Its outer surface, nearly black, is loosely connected with the sclerotic by connective tissue, in which are contained certain nerves and vessels—termed the ciliary nerves and vessels—which go to the iris. Its inner surface is soft, villous,

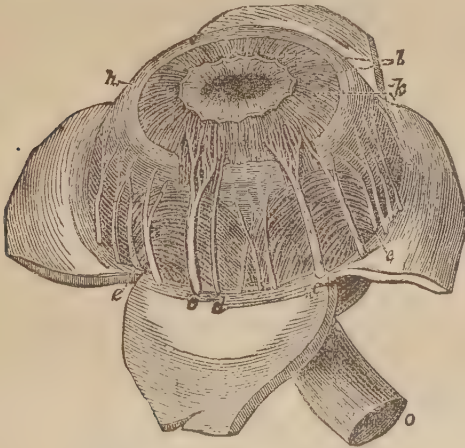


Fig. 2.

Choroid and iris, exposed by turning aside the sclerotic.

c, ciliary nerves going to be distributed in iris; *d*, smaller ciliary nerves; *e*, veins known as vasa vorticosa; *h*, ciliary ligament and muscle; *k*, *l*, converging fibres of iris; *o*, optic nerve.

and dark-colored. In front, it is attached to the membrane of the vitreous humor (see fig. 3) by means of the ciliary processes, which consists of about 60 to 70 radiating folds. These are alternately long and short, and each is termi-

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nated by a small free interior extremity; and they are lodged in corresponding folds in the membrane of the vitreous humor. In other parts, it is loosely connected with the retina. The choroid is composed of minute ramifications of vessels—especially of veins, which, from their whirl-like arrangement, are termed *vasa vorticosa*—of connective tissue, and of pigment cells, which usually approximate to the hexagonal form, and are about $\frac{1}{1000}$ th of an inch in diameter. In albinos, this pigment is absent, and hence their eyes have a pink appearance, which is due to the unconcealed blood in the capillaries of the choroid and iris.

The *iris* may be regarded as a process of the choroid, with which it is continuous, though there are differences of structure in the two membranes. It is a thin flat mem

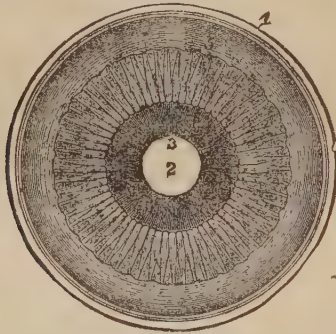


Fig. 3.

The iris and adjacent structures seen from behind.

1, the divided edge of the three coats, the choroid being the dark in-
termediate one; 2, the pupil; 3, the posterior surface of the iris; 4,
the ciliary processes; 5, the scalloped anterior border of the retina.

branous curtain, hanging vertically in the aqueous humor in front of the lens, and perforated by the pupil for the transmission of light. It divides the space between the cornea and the lens into an anterior (the larger) and a posterior (the smaller) chamber, these two chambers freely communicating through the pupil (see fig. 1). The outer and larger border is attached all round to the line of junction of the sclerotic and cornea, while the inner edge forms the boundary of the pupil, which is nearly circular, lies a little to the inner side of the centre of the iris, and varies in size according to the action of the muscular fibres of the iris, so as to admit more or less light into the interior of the eyeball; its diameter varying, under these circumstances, from about $\frac{1}{3}$ d to $\frac{1}{20}$ th of an inch. It is muscular in its structure, one set of fibres being arranged circularly round the pupil, and, when necessary, effecting its contraction, while another set lie in a radiating direction from within outward, and by their action dilate the pupil. These fibres are of the unstriped or involuntary variety.

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The nerves concerned in these movements will be presently noticed.

The varieties of color in the eyes of different individuals, and of different kinds of animals, depend mainly on the color of the pigment deposited in cells in the substance of the iris.

Within the choroid is the *retina*, which, though continuous with the optic nerve—of which it is usually regarded as a cuplike expansion—differs very materially from it in structure. Before noticing the elaborate composition on this part of the eye, which has been revealed only by recent microscopical investigation, some points may be noted regarding it which can be established by ordinary examination. It is a delicate semi-transparent sheet of nervous matter, immediately behind the vitreous humor, and extending from the optic nerve nearly as far as the lens. On examining the concave inner surface of the retina at the back of the eye, we observe, directly in a line with the axis of the globe, a circular yellow spot (*limbus luteus*), of about $\frac{1}{20}$ of an inch in diameter, called, after its discoverer, the *yellow spot of Sömmering*. There has been much discussion regarding the structure and function of this spot: Dr. Todd and Mr. Bowman, two of the most eminent English microscopists, after several examinations, regard it as a small mound or projection of the retina toward the vitreous humor, with a minute aperture in the summit. The only mammals in which it exists are man and the monkey. Its use is unknown, but vision is remarkably perfect at this spot—a circumstance which, however, may possibly be accounted for by the fact that it is singularly free from blood-vessels, which curve round it and apparently avoid it.

The structure of the retina, as revealed by the microscope, is in the highest degree remarkable. Although its greatest thickness (at the entrance of the optic nerve) is only about $\frac{1}{120}$ of an inch, and as it extends anteriorly, it soon diminishes to $\frac{1}{220}$ of an inch, the following layers from without inward may be distinguished in all parts of it: (1) The layer of rods and cones, frequently termed, from its discoverer, the *membrane of Jacob*; (2) The granular layer,

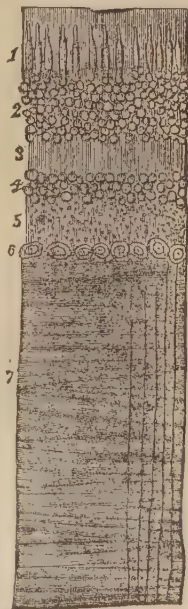


Fig. 4.

A vertical section of the human retina.

1, the layer of rods and cones (Jacob's membrane); 2, the external granular layer; 3, the intervening layer between 2 and 4, the internal granular layer; 4, the internal granular layer; 5, finer granular layer; 6, layer of nerve-cells; 7, fibres of the optic nerve; 8, limiting membrane.

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including the parts indicated by 2, 3, 4, 5 in the figure; (3) The layer of gray nerve substance; (4) The expansion of the optic nerve; and (5) The liminary membrane. These various structures are shown in fig. 4, copied from Kölliker and Müller's memoir on the structure of the retina. Details regarding the nature of these various layers are given in Kölliker's *Manual of Human Histology*, and in Todd and Bowman, *op. cit.*

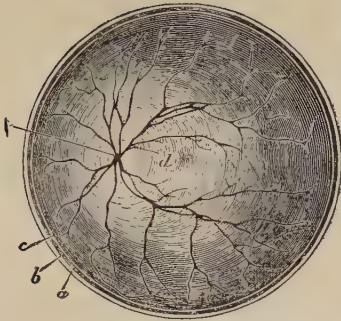
It now remains to describe the *transparent media* which occupy the interior of the globe, and through which the rays of light must pass before they can reach the retina, and form on it the images of external objects. We shall consider them in the order in which the rays of light strike them.

Immediately behind the transparent cornea is the *aqueous humor*, which fills the anterior and posterior chambers which lie between the cornea and the lens. As its name implies, it is very nearly pure water, with a mere trace of albumen and chloride of sodium. As no epithelium exists in front of the iris, or on the anterior surface of the lens, it is most probably secreted by the cells on the posterior surface of the cornea.

The *crystalline lens* lies opposite to and behind the pupil, almost close to the iris, and its posterior surface is received into a corresponding depression on the forepart of the vitreous humor (see fig. 1). In form, it is a double-convex lens, with surfaces of unequal curvature, the posterior being the most convex. It is inclosed in a transparent capsule, of which the part covering the anterior surface is nearly four times thicker than that at the posterior aspect, in consequence, doubtless, of greater strength being required in front, where there is no support, than behind, where the lens is adherent to the vitreous membrane. The microscopic examination of the substance or body of the lens reveals a structure of wonderful beauty. Its whole mass is composed of extremely minute elongated, ribbon-like structures, commonly called the *fibres of the lens*, regarded by Kölliker as *thin-walled tubes*, with clear, albuminous contents. These fibres are arranged side by side in lamellæ, of which many hundred exist in every lens, and which are so placed as to give to the anterior and posterior surfaces the appearance of a central star, with meridian lines.

The lens gradually increases in density, and, at the same time, in refracting power, toward the centre; by this means, the convergence of the central rays is increased, and they are brought to the same focus as the rays passing through the more circumferential portions of the lens. (According to Brewster, the refracting power at the surface is 1.3767, and at the centre 1.3990.)

According to Berzelius, the lens contains 58 per cent. of water, 36 of albumen, with minute quantities of salts, membrane, etc. In consequence of the albumen, it becomes hard and opaque on boiling, as we familiarly see in the case of the eyes of boiled fish. In adult man, its long diameter ranges from $\frac{1}{8}$ to $\frac{3}{8}$, and its antero-posterior



Posterior half of left Eye from the front: *a*, Cut edge of sclerotic; *b*, of choroid; *c*, of retina; *d*, Macula lutea; *e*, Optic disk or papilla.



Exorhizal Root.



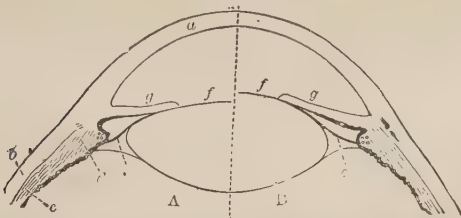
Extrorse Anthers of *Tamarix indica*.



Exostome and Endostome.



Exogen.—1, Section of a branch of three-years' growth: *a*, Medulla or pith; *b*, Medullary sheath; *e*, Medullary rays; *c*, Circles of annual growth; *d*, Bark. 2, Netted veined leaf (Oak). 3, Dicotyledonous seed: *a*, Cotyledons. 4, Germination of dicotyledonous seed: *a*, Seed-leaves or cotyledons; *o*, Plumula. 5, Exogenous flower (Crow-foot).



Eye.—Action of Ciliary Muscle and Iris in accommodation: A, (right or left) half; eye at rest, or focused for a distant object. B, (left or right) half; eye focused for a near object. *a*, Cornea; *b*, Sclerotic; *c*, Anterior part of choroid; *d*, Ciliary muscle; *e*, Suspensory ligament of lens; *f*, Anterior capsule of lens; *g*, Iris.

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diameter from $\frac{1}{8}$ to $\frac{1}{6}$ of an inch; and it weighs three or four grains.

The *vitreous humor* lies in the concavity of the retina, and occupies about four-fifths of the eye posteriorly. Its form is shown in fig. 1. It is inclosed in the hyaloid membrane, which sends numerous processes inward, so as to divide the cavity into a series of compartments, and thus to equalize the pressure exerted by the inclosed soft gelatinous mass. Between the anterior border of the retina and the border of the lens, is a series of radiating folds or plaitings termed the *ciliary processes of the vitreous body*, into which the *ciliary processes of the choroid* dovetail. The vitreous humor contains, according to Berzelius, 98.4 per cent. of water, with a trace of albumen and salts, and hence, as might be expected, its refractive index is almost identical with that of water.

The appendages of the eye now claim notice. The most important of these appendages are the *muscles within the orbit*, the *eyelids*, the *lachrymal apparatus*, and the *conjunctiva*, to which (though less important) may be added the *eyebrows*.

The *muscles* by which the eye is moved are four straight (or *recti*) muscles, and two oblique (the superior and inferior). The former arise from the margin of the optic foramen at the apex of the orbit, and are inserted into the sclerotic near the cornea, above, below, and on either side. The superior oblique arises with the straight muscles; but after running to the upper edge of the orbit, has its direc-

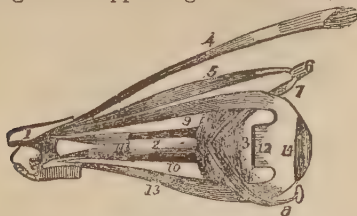


Fig. 5.

The muscles of the eyeball, the view being taken from the outer side of the right orbit.

1, a small fragment of the sphenoid bone at the back of the orbit, containing the foramen, through which, 2, the optic nerve passes; 3, the globe of the eye; 4, the levator palpebræ muscle; 5, the superior oblique muscle; 6, its cartilaginous pulley, attached to the upper edge of the orbit; 7, its reflected tendon; 8, the inferior oblique muscle, the little knob near the figure 8 being a detached fragment of the superior maxillary bone, from which it arises; 9, the superior rectus; 10, the internal rectus, partly concealed by the optic nerve; 11, 12, the two ends of the external rectus, the intermediate portion having been removed; 13, the inferior rectus; 14, the tunica albuginea, formed by the expansion of the tendons of the four recti muscles.

tion changed by a pulley, and proceeds backward, outward, and downward (see fig. 5). The inferior oblique arises from the lower part of the orbit, and passes backward, outward, and upward. The action of the straight muscles is sufficiently obvious from their direction: when acting col-

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lectively, they fix and retract the eye; and when acting singly, they turn it toward their respective sides. The oblique muscles antagonize the recti, and draw the eye forward; the superior, acting above, directs the front of the eye downward and outward, and the inferior upward and inward. By the duly associated action of these muscles, the eye is enabled to move (within definite limits) in every direction.

The *eyelids* are two thin movable folds placed in front of the eye, to shield it from too strong light, and to protect its anterior surface. They are composed of (1) skin; (2) of a thin plate of fibro-cartilage, termed the tarsal cartilage, the inner surface of which is grooved by 30 or 40 parallel vertical lines, in which the Meibomian glands are imbedded; and (3) of a layer of mucous membrane, continuous as we shall presently see, with that which lines the nostrils, and which joins the skin at the margin of the lids, in which the eyelashes (*cilia*) are arranged in two or more rows. The upper lid is much the larger; and to the posterior border of its cartilage, a special muscle is attached, termed the *levator palpebræ superioris*, whose object is to elevate the lid, and thus open the eye; while there is another muscle, the *orbicularis palpebrarum*, which surrounds the orbit and eyelids, and by its contraction closes the eye. The Meibomian glands secrete a sebaceous matter, which facilitates the free motion of the lids, and prevents their adhesion. The eyelashes intercept the entrance of foreign particles directed

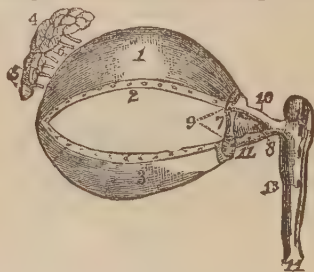


Fig. 6.

The appendages of the eye.

- 1, the cartilage of the upper eyelid; 2, its lower border, showing the openings of the Meibomian glands; 3, the cartilage of the lower eyelid, also showing on its border the openings of the Meibomian glands; 4, 5, the lacrimal gland; 6, its ducts; 7, the plica semilunaris; 8, the caruncula lachrymalis; 9, the puncta lachrymalia, opening into the lacrimal canals; 10, 11, the superior and inferior lacrimal canals; 12, the lacrimal sac; 13, the nasal duct, terminating at 14 in the lower meatus of the nose.

against the eye, and assist in shading that organ from an excess of light.

The *lacrimal apparatus* consists of the lacrimal gland, by which the tears are secreted; two canals, into which the tears are received near the inner angle of the eye; the sac, into which these canals open; and the duct, through which the tears pass from the sac into the nose. The gland is an

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oblong body, about the size of a small almond, lying in a depression in the upper and outer part of the orbit. The fluid secreted by it reaches the surface of the eye by seven or eight ducts, which open on the conjunctiva at its upper and outer part. The constant motion of the upper eyelid induces a continuous gentle current of tears over the surface, which carry away any foreign particle that may have been deposited on it. The fluid then passes through two small openings, termed the *puncta lachrymalia* (see 9 in fig. 6), into the canals; whence its further course into the lower portion of the nose is sufficiently obvious from the figure. The conjunctiva (or mucous coat) which covers the front of the eyeball, and lines the inner surface of the lids, passes down and lines the canals, sac, and duct; and is thus seen to be continuous with the nasal mucous membrane, of which it may be regarded as an offshoot or digital prolongation. See MUCOUS MEMBRANES.

The *nerves* going to this organ and its appendages in the human eye, remain to be noticed.

Into each orbit there enters a nerve of *special sense*—viz., the optic nerve, a nerve of *ordinary sensation*—viz., the ophthalmic branch of the fifth nerve, and certain nerves of *motion* going to the muscular tissues, and regulating the movements of the various parts—viz., the third, fourth, and sixth nerves.

For the optic tracts from which the *optic nerves* originate, see BRAIN: here these nerves are merely traced from their *chiasma* or commissure forward. This commissure results from the junction of the optic tracts of the two sides; and it is especially remarkable for the fact, that it presents a partial decussation of the nervous fibres; the central fibres of each tract passing into the nerve of the *opposite* side, and crossing the corresponding fibres of the other tract, while the outermost fibres, which are much fewer in number than the central ones, pass to the optic nerve of the *same* side. In front of the commissure, the nerves enter the optic foramen at the apex of the orbit, receive a sheath or investment from the *dura mater*, acquire increased firmness, and finally terminate in the retina.

The peculiar mode of termination of the optic nerves in the cuplike expansion of the retina, the impairment or loss of vision which follows any morbid affection of them, and the constant relation in size which is observed in comparative anatomy between them and the organs of vision, afford sufficient evidence that they are the proper conductors of visual impressions to the sensorium.

The first or ophthalmic division of the fifth or trifacial nerve sends branches to the skin of the eyelids and to the conjunctiva. That it is the nerve of ordinary sensation of the eye, is obvious from the following facts: (1) That in disease of this nerve in the human subject, it is not uncommon to find the eyeball totally insensible to every kind of stimulus (particles of dust, pungent vapors, etc.); and (2) that if the nerve be divided in the cranium (in one of the lower animals), similar insensibility results.

The most important of the nerves of motion of the eye is

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the third nerve, or *motor oculi*. It supplies with motor power the elevator of the upper eyelid, and all the muscles of the globe, except the superior oblique and the external straight muscle, and, in addition to this, it sends filaments to the iris and other muscular fibres within the eye. The application of an irritant (in vivisection experiments) to its trunk induces convulsive contraction of the principal muscles of the ball and of the iris; while division of the trunk occasions an external squint, with palsy of the upper eyelid and fixed dilatation of the pupil. The squint is caused by the action of the external straight and the superior oblique muscles, while the other muscles are paralyzed by the operation. The normal motor action of the nerve upon the iris, in causing contraction of the pupil, is excited through the optic nerve, and affords a good illustration of *Reflex Action* (q.v.); the stimulus of light falling upon the retina, and, through it, exciting that portion of the brain from which the third nerve takes its origin. This nerve clearly exerts a double influence in relation to vision: (1) it mainly controls the movements of the eyeball and the upper eyelid; and (2) from its connection with the muscular structures in the interior, it regulates the amount of light that can enter the pupil, and probably takes part in the adjusting power of the eye to various distances.

The fourth nerve supplies the superior oblique muscle with motor power, while the sixth nerve similarly regulates the movements of the external straight muscle—the only two muscles in the orbit which are not supplied by the third pair.

Although not entitled to be termed a nerve of the orbit, the facial nerve deserves mention as sending a motor branch to the *orbicularis* muscle, by which the eye is closed.

2. *Comparative Anatomy of the Eye*.—In *mammals*, the structure of the eye is usually almost identical with that of man. The organ is, however, occasionally modified, to meet the peculiar wants of the animal. Thus, in the Cetacea, and in the amphibious Carnivora that catch their prey in the water, the shape of the lens is nearly spherical, as in fishes, and there is a similar thickening of the posterior part of the sclerotic, so as to thrust the retina sufficiently forward to receive the image formed by such a lens. (See the subsequent remarks on the eyes of fishes.) Again, instead of the dark-brown or black pigment which lines the human choroid, a pigment of a brilliant metallic lustre is secreted in many of the carnivora, forming the so-called *tapetum lucidum* at the bottom of the eyeball, which seems (according to Bowman) to act as a concave reflector, causing the rays of light to traverse the retina a second time, and thus probably increasing the visual power, particularly where only a feeble light is admitted to the eye. The pupil, moreover, varies in form, being transversely oblong in the Ruminants and many other Herbivora, and vertically oblong in the smaller genera of Cats. These shapes are apparently connected with the positions in which the different animals look for their food. Lastly, in some mammals (for example, the horse), there is a rudi-

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mentary third eyelid, corresponding to the *membrana nictitans* of birds.

In *birds*, the eye, though presenting the same general composition as in man, differs from the mammalian eye, in several important points. From our knowledge of the habits of birds (especially birds of prey), we should naturally expect that from their rapid movements they should be able readily to alter the focus between the extremes of long and short sighted vision, and the modifications now to be mentioned clearly have this object in view.

In reference to the figure, which represents a section of

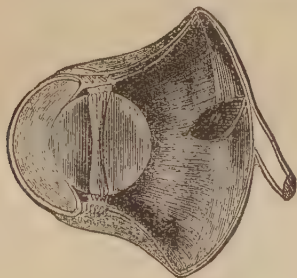


Fig. 7.—Eye of Bird.

the eye of the owl, we see (1) that the shape of the organ is not spherical, as in mammals, nor flattened anteriorly, as in fishes and aquatic reptiles, but that the cornea is very prominent, and the antero-posterior diameter lengthened; the consequence of this arrangement being to allow room for a large quantity of aqueous humor, and to increase the distance between the lens and the posterior part of the retina, and thus to produce a greater convergence of the rays of light, by which the animal is enabled to discern near objects, and to see with a faint light. In order to retain this elongated form, we find a series of bony plates, forming a broad zone, extending backward from the margin of the cornea, and lying embedded in the sclerotic. The edges of the pieces forming this bony zone overlap each other, and are slightly movable, and hence, when they are compressed by the action of the muscles of the ball, there is protrusion of the aqueous humor and of the cornea, adapting the eye for near vision; while relaxation of the muscles induces a corresponding recession of the humor and flattening of the cornea, and fits the eye for distant vision. The focal distance is regulated further by a highly vascular organ called the *marsupium* or, *pecten* lodged in the posterior part of the vitreous humor (fig. 7, a). It is attached to the optic nerve at the point where it expands into the retina, and seems endowed with a power of dilatation and contraction; as it enlarges, from distension of its blood-vessels, it causes the vitreous humor to push the lens forward, while, as it collapses, the lens falls backward again toward the retina.

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In addition to an upper and lower eyelid, birds have an elastic fold of conjunctiva, which, in a state of repose, lies in the inner angle of the eye, but is movable by two distinct muscles, which draw it over the cornea. It is termed the *membrana nictitans*; it is to a certain degree transparent, for (according to Cuvier), birds sometimes look through it, as, for example, the eagle when looking at the sun. The lachrymal gland is situated as in mammals, but there is here a second gland, the *glandula Harderi*, which yields a lubricating secretion.

There are no very special peculiarities in the eyes of *reptiles*, and we therefore proceed to notice the most remarkable points presented by the eye in *fishes*. From the

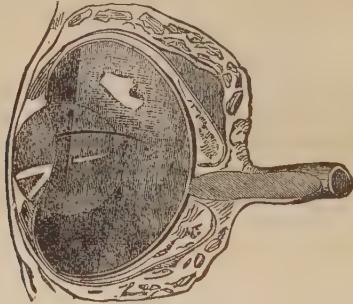


Fig. 8—Eye of Fish.

comparatively great density of the medium (water) through which the rays of light pass before they impinge upon the transparent structure of the eye of a fish, it is obvious that this organ must act as a very powerful refractive apparatus. The main peculiarity in the eye of the fish is the size, extreme density, and spherical shape of the lens, which give it such an extraordinary magnifying power that it has been employed as a simple microscope. See Brewster's *Treatise on the Microscope*, p. 31. But its focus being shortened in proportion as its power is increased, it is necessary that the retina should be brought near its posterior surface. For this purpose, the eyeball is flattened by diminishing the quantity of vitreous humor which, being of nearly the same density as the external water, exerts no perceptible power in bringing the rays of light toward a focus; and this flattened form is maintained by the existence of two cartilaginous plates in the tissue of the sclerotic, which in some of the larger fishes is actually converted into a bony cup. The aqueous humor having here no refractive power, is barely sufficient to allow the free suspension of the iris. The pupil is very large, so as to take in as much light as possible, but is generally motionless. Their eyes being constantly washed by the water in which they live, no lachrymal apparatus is necessary, nor does any exist; and the same remark applies to the *cetacea* amongst the mammals. Thus throughout the sub-kingdom of the

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vertebrata the eye is constructed according to one general scheme, with modifications to suit the mode of life of individual classes.

In all the above cases, the structure of the eye is essentially the same; that is, there are certain dioptric media for collecting the divergent rays to their proper focus on the retina, and there are the means of adjusting the eye for different distances. But if we examine the eyes of insects, we find that they are constructed on different principles.

In these animals, we have *simple* and *compound* eyes usually associated in the same individual. The simple eyes resemble in many respects the corresponding organs in higher animals, but the compound eyes are extremely elaborate and complex in their structure. They are two in number, appearing as hemispherical masses on the sides of the head. When examined with the microscope, their surface is seen to be divided into an enormous number of hexagonal facets, which are in fact corneæ. In the ant, there are only 50 of these facets in each eye; in the common house-fly, 4,000; in butterflies, upward of 17,000; and in some of the beetles more than 25,000. Each cornea is found to belong to a distinct eye, provided with a nervous apparatus, and exhibiting a lens, iris, and pupil. Strauss Durckheim, who has carefully studied these structures in the cockchafer, suggests that, the eyes of insects being fixed, nature has made up for their want of mobility by their number, and by turning them in all directions; so that it might be said that these little animals have a distinct eye for every object.

Compound eyes of similar structure occur in many of the crustaceans.

3. Having now described the anatomical structure of the eye in man and certain of the lower animals, we are able to proceed to the consideration of the uses of the various parts of this organ. Assuming a general knowledge of the ordinary laws of geometrical optics (see *DIOPTRICS: LENS: ETC.*), we will trace the course of the rays of light proceeding from any luminous body through the different media on which they impinge. If a luminous object, for example, a lighted candle, be placed at about the ordinary distance of distinct vision (about ten inches) from the front of the eye, some rays fall on the sclerotic, and being reflected, take no part in vision; the more central ones fall upon the cornea, and of these some also are reflected, giving to the surface of the eye its beautiful glistening appearance; while others pass through it, are converged by it and enter the aqueous humor, which exerts no perceptible effect on their direction. Those which fall on and pass through the outer or circumferential part of the cornea are stopped by the iris, and are either reflected or absorbed by it; while those which fall upon its more central part pass through the pupil, and are concerned in vision. In consequence of its refractive power, the rays passing through a comparatively large surface of the cornea are converged so as to pass through the relatively small pupil and impinge upon

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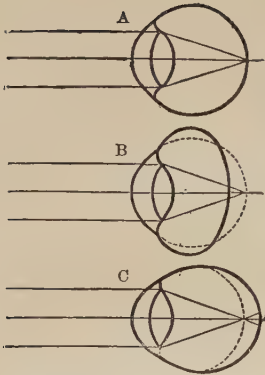
the lens, which, by the convexity of its surface, and by its greater density toward the centre, very much increases the convergence of the rays passing through it. They then traverse the vitreous humor, whose principal use appears to be to afford support to the expanded retina, and are brought to a focus upon that tunic, forming there an exact but inverted image of the object.

This inversion of the image may be easily exhibited in the eye of a white rabbit or other albino animal, after removing the muscles, etc., from the back part of the globe. The flame of a candle held before the cornea may be seen inverted at the back of the eye increasing in size as the candle is brought near, diminishing as it retires, and always moving in a direction opposite to that of the flame.

The adaptation of the eye to distinct vision at every distance beyond that of a few inches, is extremely remarkable, and numerous attempts have been made to explain the mechanism by which its focal length admits of alteration under the influence of the will. One view that has met with much support is, that the focal length is modified by a slight movement of the lens. In the eye of the bird there is a structure called the *ciliary muscle* which obviously approximates the lens to the cornea when a short field of view is required, and though the corresponding structure is only slightly developed in man and mammals, it is probably sufficiently strong to produce the slight action required; while for the vision of distant objects the lens is carried back toward the retina by the elasticity of the connecting tissues. It appears, however, from recent researches of Cramer, Helmholtz, Allen Thomson, and others, that the accommodation is effected rather by a change in the *form* than in the *position* of the lens. It has been experimentally proved, that when the eye is turned from a distant to a near object, the antero-posterior diameter of the lens becomes elongated, and the anterior surface becomes more convex, while the opposite changes take place in turning the eye from a near to a distant object. According to Helmholtz, the radius of curvature of the anterior surface of the lens diminishes on turning the eye to a near object from ten to six millimetres (from about 0.4 to 0.24 of an inch), while the most projecting point of the same surface is brought forward about 0.2 of an inch.

Whichever view be adopted, the ciliary muscle takes an active part in the process. According to the observations of Hueck, the focal distance may be changed about three times in a second. The accommodation from a near to a distant object is effected much more rapidly than the converse process.

There are two well-known forms of defective vision in which this power of adaptation is very much limited—viz., short-sightedness or *myopia*, and long-sightedness or *presbyopia*. The limitation, however, is due not to a defect in the muscular apparatus to which we have referred, but to an abnormality either in the curves or in the density of the refracting media. In *short-sightedness* from too great a re



A, Normal eye: parallel rays brought to a focus at retina. B, Hypermetropic eye: globe shortened; parallel rays not yet brought to a focus when they reach retina. C, Myopic eye: globe lengthened; parallel rays brought to a focus in front of retina.



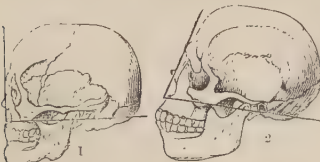
Greenland Falcon (*Falco candicans*).



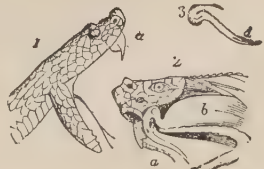
Peregrine Falcon (*Falco peregrinus*).



Faldstool.



Facial Angle: 1, European; 2, Negro.



Fangs of Serpent: 1, Head of Common Viper (*Peleas Berus*); a, Poison-fang. 2, Head of Rattlesnake cut open: a, Poison-fang; b, Poison-bag; c, Tube which conveys the poison to the fangs. 3, Fang, showing the slit (d) through which the poison is communicated to the wound.

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fractive power from either cause, the rays from objects at the ordinary range of distinct vision are brought too soon to a focus, so as to cross one another, and begin to diverge before they fall on the retina; the eye in this case being able to bring to the proper focus on the retina only those rays which were previously diverging at a large angle from a very near object. The correction for this deficiency is accomplished by interposing between the eye and indistinctly-seen objects a *concave* lens, with a curvature just sufficient to throw the images of external objects at the ordinary distance of distinct vision backward, upon the retina. In *long-sightedness*, on the other hand, there is an abnormal diminution of the refractive power from too flat a cornea, a deficient aqueous humor, or a flattening of the lens, so that the focus is behind the retina. This defect is corrected by *convex* lenses, which increase the convergence of the rays of light. Long-sightedness, as its name *presbyopia* indicates, usually comes on at a comparatively advanced period of life, while short-sightedness is most frequent in young persons; but both these rules present occasional exceptions; and the common belief that the latter affection naturally disappears after the middle period of life, is altogether erroneous.

We have already noticed the most essential use of the iris—viz., its power, under the influence of light upon the retina, of modifying the size of the pupil, so as to regulate the amount of light entering the eye. But this is not its only use; one of its offices being to prevent the passage of rays through the circumferential part of the lens, and thus to obviate the indistinctness of vision which would arise from *spherical aberration* (the unequal refraction of the rays passing through the centre and near the margin of the lens), in the same manner as the diaphragms employed by the optician. But there are additionally two other means by which this spherical aberration is prevented, which well illustrate the wondrous mechanism of the eye. They are described by Prof. Wharton Jones as follows:

(1.) 'The surfaces of the dioptric parts of the eye are not spherical, but those of the cornea and posterior surface of the lens are hyperbolic, and that of the anterior surface of the lens elliptical—configurations found by theory fitted to prevent spherical aberration. This discovery was made at a time when it was not known but that the dioptric parts of the eye had spherical surfaces.

(2.) 'The density of the lens diminishing [as above shown] from the centre to its periphery, the circumferential rays are less refracted than they would have been by a homogeneous lens with similar surfaces. This elegantly simple contrivance has been hitherto inimitable by human art.'—*The Actonian Prize Treatise*, 1851, p. 50.

Chromatic aberration, caused by the unequal refrangibility of the primitive rays of which white light is composed, when transmitted through an ordinary lens, whereby colored fringes are produced, is *practically* corrected in the eye, though it is doubtful whether it is *entirely* absent. The provision, however, on which the achromatism de-

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pends has not been determined with certainty, probably because we do not yet know the relative refractive and dispersive powers of the cornea and humors of the eye. Sir David Brewster denies that the chromatic aberration receives any correction in the eye, and maintains that it is imperceptible only in consequence of its being extremely slight.

4. We have hitherto been considering the eye as an optical instrument which projects pictures of external objects on the retina; we now come to the action of the nervous tunic, the *retina*, and its adaptation to the physical construction of the eye.

When the retina or the optic nerve is stimulated, we have the sensation of light, whatever may be the nature of the stimulus employed—as, for example, if it be a blow on the eye in the dark, or irritation of the optic nerve from some morbid condition. The sensation of light, then, consists in a recognition by the mind of a certain condition of these nervous structures, and this condition may be induced by the application of any stimulus; the ordinary stimulus obviously being the rays of light which fall upon the retina. There must, however, be a certain amount of light for the purpose of vision. It is difficult and painful to discern objects in a very faint light; but on the other hand, on suddenly entering from the dark into a brilliantly lighted room, everything appears confused for one or two seconds. There is, however, a gradual adaptation of the retina to different amounts of light. Persons long immured in dark dungeons acquire the power of distinctly seeing surrounding objects; while those who suddenly encounter a strong light, are unable to see distinctly until the shock which the retina has experienced has subsided, and the iris has duly contracted. In protecting the retina from the sudden effects of too strong a light, the iris is assisted by the eyelids, the orbicular muscle, and, to a certain extent, by the eyebrows. Moreover, the dark pigment of the choroid coat acts as a permanent guard to the retina, and where it is deficient, as in albinos, an ordinary light becomes painful, and the protective appendages, especially the eyelids, are in constant use.

The persistence, during a certain time, of impressions made on the retina, facilitates the exercise of sight. A momentary impression of moderate intensity continues for a fraction of a second; but if the impression be made for a considerable time, it endures for a longer period after the removal of the object. Thus, a burning stick, moved rapidly in a circle before the eyes, gives the appearance of a continuous ribbon of light, because the impression made by it at any one point of its course remains on the retina until it again reaches that point. It is owing to this property that the rapid and involuntary act of winking does not interfere with the continuous vision of surrounding objects; and, to give another illustration of its use, if we did not possess it, the act of reading would be a far more difficult performance than it now is, for we should require to keep the eye fixed on each word for a longer period, otherwise

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the mind would fail fully to perceive it. Again, in consequence of the retention of sensations by the retina, the image of an object may continue to be seen, especially in certain morbid states of the system, and in twilight, for some seconds after the eyes have been turned away from it, and this physiological phenomenon has probably given origin to many stories of ghosts and visions. Thus, if a person has unconsciously fixed his eyes, especially in the dusk, on a dark post or stump of a tree, he may, on looking toward the gray sky, see projected there a gigantic white image of the object, which may readily be mistaken for a supernatural appearance. These ocular spectra are always of the complementary color to that of the object. Thus, the spectrum left by a red spot is green; by a violet spot, yellow; and by a blue spot, orange. However great may be the velocity of a luminous body, it can always be seen; but if an opaque body move with such rapidity as to pass through a space equal to its own diameter in a less time than that of the duration of the retinal impression, it is altogether invisible; and hence it is, for example, that we cannot see bullets, etc., in the rapid part of their flight.

A small portion of the retina, corresponding to the entrance of the optic nerve, is incapable of exciting the sensation of vision when it receives the image of an object. According to Volkmann, this small spot exactly corresponds in size with the artery lying in the centre of the optic nerve. If the 'blind spot' had been situated in the axis of the eye, a blank space would always have existed in the centre of the field of vision, since the axis of the eyes in vision correspond. But as it is, the blind spots do not correspond when the eyes are directed to the same object. Hence the blank which one eye would present is filled up by the other eye. Mariotte, early in the last century, first described the existence of these blind spots. Any one may satisfy himself of their existence by the following simple experiment. Let two small black circles be made upon a piece of paper, about four or five inches apart, then let the left eye be closed, and the right eye be strongly fixed upon the left-hand circle. If the paper be then moved backward and forward, a point will be found at which the right-hand circle is no longer visible, though it reappears when the paper is either brought nearer or removed further. Although no other part of the retina possesses the complete insensibility presented by the blind spot it is probable that its anterior portions have very little to do with vision. When using only one eye, we direct it toward the object we wish to inspect, in such a way as to throw the image to the back of the globe; and when the eye is thus fixed, objects near the boundary of the field of vision are less distinctly seen than those at its centre.

The extent of the field of vision for a single eye, the head being fixed, has been calculated by Dr. Young. He found that the eyeball was capable of a movement of 55 degrees in every direction, so that a single eye may have perfect vision of any point within a range of 110 degrees.

We have not yet referred to the longitudinal range, or

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greatest distance of human vision; indeed, this range varies so extremely that it is difficult to assign an arbitrary limit to it. Many uncivilized races, as the N. America Indians, and the inhabitants of the vast Asiatic steppes, possess powers of sight which would be almost incredible if they had not been thoroughly and frequently corroborated. Our information is more definite regarding the limits of human vision in regard to the minuteness of the objects of which it can take cognizance. Elhrenberg has carefully studied this subject, and has arrived at the following results. The side of the smallest square magnitude usually visible to the naked eye—either of white particles on a black ground or conversely—is about $\frac{1}{405}$ th of an inch; and with the greatest condensation of light and effort on the part of the observer, squares with a side as small as $\frac{1}{840}$ th of an inch may be recognized, but without sharpness or certainty. Bodies smaller than these, when observed singly, cannot be discerned by the *naked* eye, but may be seen when placed in a row. Much smaller particles may, however, be distinctly seen, if they powerfully reflect light, thus, gold-dust, which in none of its diameters exceeded $\frac{1}{1125}$ th of an inch, is easily discernible in common daylight. The delicacy of vision is far greater for lines than for minute areas, since opaque threads of $\frac{1}{4000}$ th of an inch may be discerned when held toward the light.

For various topics, such, for instance, as 'single vision with two eyes,' 'the appreciation of solid forms by the sense of vision,' 'correct vision with an inverted image on the retina,' etc., which belong as much to metaphysics as to physiology, see VISION: also Prof. Bain's treatise on *The Senses and the Intellect*.

EYE, DISEASES OF THE: very numerous and various, partly from the variety of the tissues and parts of which it is formed, partly because the exposed situation and transparency of the eye enable the diseases to be seen. Nearly all its parts are liable to inflammation and its consequences: see OPHTHALMIA. The eyelids are liable to various diseases, as growths of several kinds, most of which the surgeon may remove; inflammation, as *blear-eye* (ophthalmia tarsi); to be misdirected inward or outward, *Entropium* and *Ectropium* (q.v.); and the upper eyelid may fall down (ptosis) from palsy of the common motor oculi nerve. The eyelashes may grow in upon the eye (trichiasis), and produce serious results. When plucked out they grow again; and if they still grow in upon the eye after this palliative treatment has been tried several times, the surgeon has to cut down on their roots, and destroy them. The duct which conveys away the tears to the nose is liable to inflammation and obstruction, causing watery eye: see LACHRYMAL ORGANS. The cornea is liable to opacity in various degrees. The mere *nebula* or cloudy condition, either limited or general, may pass off, and leave the cornea again clear; but the white mark, which is the cicatrix or scar of an ulcer, is permanent, though it may become smaller by the disappearance of the surrounding haze. The

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pupil may be closed as the result of iritis, or of operations for cataract, and an artificial pupil may be made by either of the three methods—incision, excision, or separation—but the operation is seldom successful. For opacities of the crystalline lens, see CATARACT. For an account of diseases of the nervous parts of the eye, see AMAUROSIS. Various affections of vision may arise from peculiar or altered conditions of the refracting humors of the eye—as near-sightedness (myopia), far-sightedness (presbyopia), the appearance of bodies (muscæ) floating in or before the eye; and there may be double vision (diplopia), with two eyes or with one: see VISION. The parts between the eye and its bony orbit may be the seat of inflammation, abscess, or tumor, making the eye protrude. The movements of the eyeballs may be affected from palsy of the motor nerves, or from contraction of the lateral recti muscles, causing inward or outward squinting: see SQUINTING. The eye may lose all feeling, from palsy of the fifth pair of nerves. The whole of the same side of the face, nostril, and mouth, will be in the same condition, and the eye becomes inflamed and disorganized. Substances thrown against the eye may injure it. Quicklime is rapidly destructive to the eye, slacked lime and mortar less so. When one of these, or any other caustic, has made entrance into the eye, sweet oil is the best thing to introduce, until the surgeon arrives to remove them. If it is oil of vitriol (sulphuric acid) that has been the cause of the injury, a weak solution of soda may be used in the first place to neutralize the acid. In gunpowder explosions near the eye, besides the burn, the particles are driven into the surface of it, and will cause permanent black stains over the white of the eye, unless they are carefully removed at the time. When chips of glass, stone, etc., are driven into the interior of the eye, there is little hope of it being saved from destructive inflammation. When only partially sunk into the cornea, as is often the case with sparks of hot iron, or ‘fires,’ as they are called, the rubbing of the projecting part on the eyelid causes great pain, and the surgeon has not much difficulty in removing them. Most commonly these, or other ‘foreign bodies,’ as particles of dust, sand, seeds, flies, etc., merely enter the space between the eyeball and the lids, almost always concealed under the upper, as it is the larger, and sweeps the eye. They cause great pain, from the firmness and sensitiveness of the papillary surface of the lid, soon excite inflammation, and their presence, as the cause, is apt to be overlooked. The lid must be turned round to find them. To do this, pull the front or edge of the lid forward by the eyelashes, held with the finger and thumb, and at the same time press down the back part of the lid with a small pencil or key. The lid will readily turn round, when the body may be seen about its middle, and may be removed with the corner of a handkerchief. Another plan is to pull forward the upper lid by the eyelashes, and push the lashes of the lower lid up behind it, when the foreign body may be brushed out.

EYEBRIGHT—EYOT.

EYEBRIGHT (*Euphrasia*): genus of plants of the nat. ord. *Scrophulariaceæ*, having a tubular calyx, the upper lip of the corolla divided, the lower of three nearly equal lobes, the cells of the anthers spurred at the base, a two-celled capsule and striated seeds. (See EUPHRASY.) Some of the species are root-parasites. **COMMON E.** (*E. officinalis*), is a little plant of at most six or eight inches in height, with ovate serrated leaves, and white or reddish flowers streaked with purple, appearing singly in the axils of the leaves. It is very abundant in many pastures in Europe, and even on



Common Eyebright.
(*Euphrasia officinalis*.)

high mountains, where—as in far northern regions—it is often seen of only an inch in height, gemming the ground abundantly with its bright little flowers. It is a very widely distributed plant, a native of most parts of the n. of Asia, the Himalaya, etc. It was formerly in great repute as a cure for ophthalmia, and is still much used in rustic practice for diseases of the eye. A spot on the corolla, something like a pupil, gave it much of its reputation, while the fanciful doctrine of *signatures* prevailed in medicine; but it has been found really efficacious in catarrhal inflammations of the eye, and in other catarrhal affections. It is a weak astringent. It is the *Euphrasy* of Milton, with which he represents the archangel Michael as *purging the visual nerve* of Adam.

EYLAU, *ī'low*, usually called Prussian Eylau: town in the govt. of Königsberg, 22 m. s. of the town of Königsberg; celebrated for the battle between Napoleon and the allies—Russians and Prussians—under Bennigsen, 1807, Feb. 8. The French force amounted to about 80,000, and the allies numbered 58,000, but were superior in artillery. The battle opened soon after daylight with a furious attack by the French left on the Russian right and center, which proved utterly unsuccessful, the attacking corps being almost destroyed. The murderous struggle was repeatedly renewed, and the promise of victory alternated now to the one side and now to the other. Night closed upon the whole allied line pressing onward and driving the French before them. Nevertheless, the victory is generally claimed by the latter, chiefly because the allied forces, unable to recruit their strength, were ordered to retreat from the field on the night of the battle, and to retire upon Königsberg. The loss of the allies is estimated at about 20,000, while that of the French must have been considerably greater.—Pop. of town abt. 3,600.

EYOT, n. *ī'öt* or *āt* [AS. *ey*, or *ig*; Icel. *ey*, an island: a little island in a river or lake; usually written *ait*.

EYRANT—EZEKIEL.

EYRANT, or **AYRANT**, a. *ā'rant*: in *her.*, term applied to eagles and other birds in their nests.

EYRE, n. *ār* [OF. *eirre*, a journey—from L. *iter*, a journey—gen. *itineris*, of a journey]: in *law*, a journey in circuit of certain judges: see **EIRE**, **JUSTICES IN**.

EYRE, *ār*, **EDWARD JOHN**: explorer and colonial governor: b. 1817; son of an English clergyman in Yorkshire. Emigrating to Australia at the age of 17, he was prosperous, and soon became a magistrate. In 1840, he failed in an attempt to explore the region between S. and W. Australia—a task which he accomplished in 1841 in spite of enormous difficulties. In 1846, he became lieut. gov. of New Zealand, and in 1852 of St. Vincent. In 1862 he was appointed gov. of Jamaica, where in 1865 negro disturbances broke out. E., resolving upon prompt measures, proclaimed martial law; a Mr. Gordon, believed to have had a leading part in the rising, was hurriedly tried by court-martial, and hanged two days after, the sentence having been confirmed by E. A commission sent to inquire into this case, found that Gordon had been condemned on insufficient evidence, and E. was recalled. On his return he was prosecuted for murder by a committee, of whom J. Stuart Mill was the most prominent; Mr. Carlyle and Sir R. Murchison promoted the E. defense fund. The charge of murder was dismissed by the magistrates of Market-Drayton 1867. Since then E. has lived in retirement.

EYRIE, or **EYRY**, n. *ē'ri* or *ā'ri* [OF. *aire*, an eyry or nest of hawks (see **AERIE**)]: the nest of a bird, especially of a bird of prey; spelled also *aerie*. **EYAS**, n. *ī'ās* [F. *niais*, simple; originally meant, 'caught in the nest'—from *nidus*, a nest]: a young hawk just taken from the nest, and not able to prey for itself

EZEKIEL, *ē-zē'kī-ēl* (meaning 'God will strengthen,' or 'strength of God'): one of the Hebrew prophets, son of the priest Buzi. With Jehoiachin, King of Judah, he was carried captive, when still a young man, to Mesopotamia, by order of Nebuchadnezzar, about B.C. 598. He was a member of the Jewish community which settled on the banks of the river Chebar, and first appeared as a prophet about B.C. 594. His prophetic career extended over a period of 22 years. The date of his death is not recorded.

The **BOOK OF EZEKIEL** consists of three great parts: the *first* (chapters i.—xxiv.), composed before the final conquest of Jerusalem by Nebuchadnezzar, announces the complete overthrow of the kingdom of Judah, on account of its increasing unfaithfulness to God; the *second* (chapters xxv.—xxxii.) threatens the surrounding nations, which were exulting maliciously over the ruin of Judah, with divine punishment; and the *third* (chapters xxxiii.—xlviii) prophesies the future deliverance of the Hebrew nation, and the rebuilding of Jerusalem. This last portion is generally believed to contain several Messianic predictions, three of which are considered specially remarkable (chaps. xxxvi., xxxvii.; xxxviii., xxxix.; and xl.—xlvi.); and it is beyond all question that only under a world-wide dispensation like

EZRA.

the Christian can the glorious visions of the prophet receive a historical realization. The book is full of magnificent but artificial symbolism, and of allegories difficult to understand; whence Jerome calls it 'a labyrinth of the mysteries of God;' but here and there, as in chapters i. and ii., it contains visions that indicate a most vivid and sublime imagination. E.'s authorship of the book has been questioned. The Talmud says, it was written by the Great Synagogue, of which E. was not a member; and Ewald, believing that traces of later elaboration are obvious, suggests that the collection and combination of the various prophecies into a book may not have been the prophet's own doing. The opinion of most critics, however, is, that a prophet who was so much of a literary artist as E., was more likely to have completed the book himself than to have left such a work to others. The text is far from being in perfect condition. It is partly corrupted by glosses, has partly been retouched by later hands, and may often be amended by the Septuagint version. See commentaries and works on Ezekiel by Hävernick, Hitzig, Ewald (in *The Prophets of the Old Testament*), Fairbairn, Hengstenberg, Keil.

EZRA, *ēz'rá*: Jewish lawgiver, B.C., 5th c.; descended from a distinguished priestly family, and resident in Babylon in the reign of Artaxerxes Longimanus. With this monarch he seems to have been in considerable favor, and obtained permission B.C. 478 to return to Jerusalem with a band of his countrymen amounting to 1754. His services to the new colony in regard to their civil and religious condition were very important. He endeavored to re-impose more strictly the law of Moses, forbidding marriages with heathen women, and disannulling such ties where they had been formed. He also introduced into Jewish literature the square Chaldee character, instead of the old Hebrew or Samaritan one, which had been customary till then; but the tradition that he re-wrote from memory the sacred books burned at the destruction of the temple, deserves no regard; and it is likewise a mere tradition that as president of the so-called Great Synagogue (an assemblage of Jewish scholars) he arranged and completed the canon of the Old Testament. See **BIBLE**.—The book called by his name, with the book of Nehemiah, formed, among the Jews, the first and second books of Ezra. It records events which extended over nearly 80 years, and divides itself naturally into two parts. The first six chapters embrace a period of 21 years, and relate the history of the first return from the Babylonian captivity; the rest of the book chronicles the *second* return under Ezra the priest, in the reign of Artaxerxes Longimanus. The book is written partly in Chaldee; and is by some critics supposed to be the work of various authors. But the Jews have always maintained its canonical authority, and have even compared Ezra with Moses. Those who ascribe to him the authorship of the whole book, consider that he drew from various sources the materials for the first part. The second part relates events in which he was himself the leader.

F.

F, f, *ef*: sixth letter in the Latin and English alphabets, corresponding to the *Vau* of the Hebrew, and the *Digamma* (q.v.) of the old Greek alphabet: see ALPHABET. *F* and *v* are called *labio-dentals*, from the organs employed in sounding them; they belong to the class of consonants called aspirates (q.v.), and bear the same relation to each other that exists between the unaspirated labials *p* and *b*. In Latin, *f* had a peculiar sound, different from that of Greek *φ*, as we learn from Cicero and other Latin writers. What the sound was, we do not exactly know, but it approached a strongly breathed *h*, as is indicated by the fact, that in the Sabine dialect it sometimes takes the place of *h*, as Sab. *fircus* = Lat. *hircus* (a he-goat); and the Latins made use both of *faba* and *haba* for 'a bean.' This affinity is also shown in modern Spanish; where *h* takes the place of the Latin *f*; as Lat. *femina*, Sp. *hembra*; *fl* becomes, in Spanish, *ll*, as Lat. *flamma* = Sp. *llama*. *F*, in English and other Teutonic tongues, corresponds to *p* in Greek and Latin; as Lat. and Gr. *pater* = Eng. *father*; Gr. *pod-*, Lat. *ped-* = Eng. *foot*; Lat. *pisc-* = Eng. *fish*; Gr. *pur* = Eng. *fire*; Lat. *vulp-* = Eng. *wolf*. In some words, *v* takes the place in German of *f* in English; as Ger. *vater* = Eng. *father*; Ger. *vier* = Eng. *four*. In the Aberdeenshire dialect, *f* takes the place of *wh*, as *fat* for *what*; *fup* for *whip*. This seems to be a relic of the Teutonic pronunciation of *w* (= *v*), still observed in the Cockney pronunciation of *vill* for *will*, *ven* for *when*; but why the sharpening of the labial into *f* should be confined to one circumscribed district of Scotland, and to the case of *w* followed by *h*, is not evident.

F in Lat. and Greek becomes *b* in Eng.; as Gr. and Lat. *fer-* = Eng. *bear*; Lat. *frater* = Eng. *brother*. See Letter B.

More remarkable are the interchanges between *f* and the series *d*, *th*, *t*. Lat. *foris* = Gr. *thura*, Eng. *door*; Lat. *fera* = Gr. *ther*, Eng. *deer*; Eng. *red*, Skr. *ruthira*, Gr. *eruthros*, Lat. *rutilus*, *rufus*, *ruber*. In Russian, *Feodor*, *Afanasja* = *Theodor*, *Athanasia*. In words originally common to both Greek and Latin, the Greek *φ* is represented in Lat. by *f*; as Gr. *φῆνῆ* = Lat. *fama*. But in spelling Greek words with Latin letters, the Romans, after the time of Cicero, were careful to represent *φ*, not by *f*, which had a somewhat different power, but by *ph*. This mode of spelling words derived from Greek is still adhered to in English, German, and French, though the distinction in sound has long been lost sight of. The distinction began to disappear in the Latin itself in the time of the later Roman emperors, when inscriptions show such spelling as *Afrodite* for *Aphro-*

FA—FABER.

dile; and this simplification is followed in modern Italian, Spanish, and Portuguese. *Ph* is sometimes erroneously used in words having no connection with Greek; as Adolphus, for the Teutonic Adolf or Adalolf—i. e., 'noble wolf.

F, as a numeric symbol, is used for 40, and with a dash over it for 40,000.

F, in Music: fourth note of the natural diatonic scale of C; stands in proportion to C as 4 to 3, and is a perfect fourth above C as fundamental note. F major, as a key, has one flat as its signature—viz., B. flat. F minor has four flats the same as A flat major, of which it is the relative minor.

FA, *fá*: in *music*, the fourth sound in the scale of the sol-fa notation = F.

FAAM, *fā'am*, or FAHAM, *fū'ham* (*Angracum fragrans*): an orchid, native of India and the Mascarene Isles, much prized in the East for the delightful fragrance of its leaves, due to the presence of *Coumarine* (q. v.), and resembling that of the Tonka Bean and of Vernal Grass. In the Isle of Bourbon, an infusion of F. leaves is in great repute as a cure for pulmonary consumption and as a stomachic. In France, it has been successfully used under the name of *Isle of Bourbon Tea*, as an expectorant, anti-spasmodic, and stomachic.

FABACEOUS, a. *fā-bā'shūs* [L. *faba*, a bean]: bean-like; pertaining to a bean. FABACEÆ: see LEGUMINOSÆ.

FABER, n. *fā'ber* [L.]: a fish, the dory.

FABER, *fā'ber*, CECILIA BÖHL VON: 1797–1877, Apr. 7; b. Morges, Canton de Vand, Switzerland: Spanish novelist. She received the greater part of her education in Germany, learned German, Spanish, Latin, English, French, and Italian languages; and married first, 1814, Capt. Planells, with whom she lived in the United States some years; then, on his death, the Marques de Arco Hermosa, who introduced her to the court at Madrid; and, again becoming widow 1835, Señor de Arrom, a lawyer with whom she had little happiness. It was not till after her 50th year that she became an author, and assumed the masculine pseudonym *Fernan Caballero*. Her first novel was *La Gaviota*, and appeared in instalments in a Madrid newspaper 1849. It was followed by *Elia*, *Clemencia*, *La Familia de Alvareda*, *Una en Otra*, *Simon Verde*, and numerous *Cuadros de Costumbres populares*, all of which in translated form achieved a European reputation. In 1859 she was appointed governess to the royal children, and an edition of her works in 13 vols. was issued from the royal printing press.

FABER, *fā'ber*, FREDERICK WILLIAM, D.D.: 1814, June 28—1863, Sep. 26; b. Calverly, Yorkshire, England: hymnologist and theologian. He graduated at Oxford 1836; became rector of Elton 1843; adopted the Rom. Cath. faith 1845; founded a religious community at Birmingham, called Wilfridians, which was merged into the oratory of St. Philip Neri and established in London 1849 and at Brompton 1854; and presided over the oratory till death. He had a deeply fervent devotional spirit and was an elo-

FABER.

quent preacher, a lovable man, and author of the hymns: *The Greatness of God, The Will of God, The Eternal Father, The God of My Childhood, Jesus is God, The Pilgrims of the Night, The Land Beyond the Sea, Sweet Saviour, bless us ere we go, I was Wandering and Weary, and The Shadow of the Rock*. He also edited the *Oratorian Lives of the Saints*, and published numerous essays, tracts, and doctrinal works.

FABER, GEORGE STANLEY: Anglican clergyman and author: 1773, Oct. 25—1854, Jan. 27; eldest son of the Rev. Thomas F. He entered Univ. College, Oxford, 1789, where he achieved a brilliant academical reputation. Before his 21st year, he was elected fellow and tutor of Lincoln College. In 1796, he took his degree of M.A.; was Bampton lecturer 1801, in which capacity he delivered the lectures subsequently published under the title of *Horæ Mosaicæ*; and 1805 became vicar of Stockton-on-Tees, Durham. After several changes, he received 1832, the mastership of Sherburn Hospital, near the city of Durham, where he died. F. wrote more than 40 works, several of which, especially those on prophecy, have had extensive popularity. All his writings show classical erudition, and 'a hearty love of hypothesis.' The principal are—*The Genius and Object of the Patriarchal, the Levitical, and the Christian Dispensations* (1823, 2 vols.); *The Difficulties of Infidelity* (1824); *The Sacred Calendar of Prophecy* (1828, 3 vols.); *The Primitive Doctrine of Election* (1836), reckoned by some critics his best work; *The Primitive Doctrine of Justification* (1837); and *Eight Dissertations upon the Prophetical Promises of a Mighty Deliverer* (1845, 2 vols.).

FABER, *fâ-bâ'* (or LEFÈVRE), JACOBUS: 1450–1536; b. Etaples, Picardy, France: pioneer of Protestantism in France. He was of humble parentage, but graduated at the Univ. of Paris. He taught some time, pursued classical studies in Italy, and became prof. of the college of Card. Lemoine in Paris. In 1507, he went to the Benedictine abbey of St. Germain des Près, near Paris, to reside, and there applied himself to Biblical study. Previously he had published with commentaries the *Physics, Methaphysics*, and *Ethics* of Aristotle; now he began more important labors. In 1509 he brought out *Quintuplex Psalterium; Gallicum, Romanum, Hebraicum, Vetus, Conciliatum*; 1512, *S. Pauli Epistolæ xiv. ex vulgate Editione, adjecta intelligentia ex Græco cum commentariis*; 1517, *De Maria Magdalena et triduo Christi disceptatio*, which was condemned by the Sorbonne; and 1523 his French translation of the New Test. and *Les Epistres et Evangiles pour les LII. dimanches de l'an à l'usage du diocèse de Meaux*. He was condemned and had his works suppressed by parliament 1525, but the proceedings were subsequently quashed; became librarian in the royal palace at Blois 1526; published a translation of the Pentateuch 1528; and completed his translation of the Bible 1530.

FA'BER, JOHN: d. prob. 1756; son of John F. (mezzotint engraver, b. Holland, came to England, d. Bristol, 1721, May): like his father an engraver in mezzotinto. His principal works are the portraits of the Kit-Cat Club, and

FABIAN—FABLE.

the Beauties of Hampton Court, several of which are executed with great freedom, vigor, and beauty. F. lived in London, where he is believed to have died.

FABIAN, a. *fā'bī-ān*: applied to tactics, or to a policy of careful waiting and watching without any positive conflict, in order to weary out an opponent, or take advantage of his errors—so named from Quintus *Fabius* Maximus (see **FABIUS**). **FABIAN GENS**: see **FABIUS**.

FABIUS, *fā'bī-ūs*: name of one of the oldest and most illustrious patrician families of Rome. Three brothers of this name alternately held the office of consul for seven years (B.C. 485-479). In 479, the Fabii, under K. Fabius Vibulanus, migrated to the banks of the Cremera, a small stream that flows into the Tiber a few miles above Rome. Here, two years afterward, they were decoyed into an ambushade by the Veientes, with whom they had been at war, and with the exception of one member, who had remained at Rome, and through whom the race was perpetuated, the entire *gens*, 306 men, were put to the sword.—The most eminent of the Fabii were Quintus Fabius Rullianus—supposed the first who obtained for himself and his family the surname of *Maximus*—and his descendant, Quintus Fabius Maximus Verrucosus, named Cunctator, the Delayer. The former was the most eminent of the Roman generals in the second Samnite war, was twice dictator, and six times consul.

FABIUS CUNCTATOR (d. B.C. 203), who, in the course of his career, was five times consul, and twice censor, was elected dictator immediately after the defeat of the Romans at Trasimenus. The peculiar line of tactics which he observed in the second Punic war obtained for him the surname by which he is best known in history. Hanging on the heights like a thundercloud, to which Hannibal himself compared him, and avoiding a direct engagement, he tantalized the enemy with his caution, barassed them by marches and counter-marches, and cut off their stragglers and foragers, while his delay allowed Rome to assemble her forces in greater strength. This policy—which has become proverbial as 'Fabian policy'—although the wisest in the circumstances, was not appreciated either in the camp or at home; and shortly afterward Marcus Minucius Rufus, Master of the Horse, was raised to an equal share in the dictatorship, a position, however, which he held only a short time. During his fifth consulship, Fabius recovered Tarentum, which had long been one of Hannibal's important positions.

C. FABIVS, surnamed Pictor, executed upon the walls of the temple of Salus—dedicated by the dictator C. Junius Brutus Bubulus in 302—the earliest Roman paintings of which we have any record; and his grandson Q. Fabius Pictor, was the first writer of a Roman history in prose.

FABLE, n. *fā'bl* [F. *fable*—from L. *fabŭlā*, a story]: a short tale or story intended to instruct or amuse, the incidents of which are improbable: an idle story; a falsehood: V. to write fiction; to tell falsehoods; to feign. **FABLING**,

FABLE.

imp. *-blīng*: ADJ. dealing in fables. FABLED, pp. *fā'blā*: ADJ. feigned; celebrated in fables. FA'BLER, n. one who. FABULIST, n. *fāb'ū-līst*, a writer of fables. FAB'ULOUS, a. *-lūs*, full of fables, pretended or feigned; fictitious. FAB'ULOUSLY, ad. *-lī*. FAB'ULOUSNESS, n. FAB'ULIZE, v. *-līz*, to compose fables; to write or speak in fable. FAB'ULIZING, imp. FAB'ULIZED, pp. *-līzēd*.—*Fable* is a word of two-fold signification. First, it is employed by some writers in a general sense to denote any fictitious narrative, as for example, the incidents in an epic or dramatic poem. At one time also, when the myths of the Greeks and Romans were thought to be satisfactorily accounted for by regarding them as conscious inventions of the ancient poets and priests, it was customary to speak of them as *fables*, but this application of the term is now abandoned by scholars: see МѢТЯ. According to the second and more frequent signification of the word, *Fable* denotes a special kind of literary composition, either prose or verse, in which a story of some kind is made the vehicle for conveying a universal truth. It differs from a parable in this respect, that while the latter never transcends in conception the bounds of the probable or the possible, the former always and of necessity does. The story of the 'Good Samaritan' imagined by the Savior, is a parable; if it was not history, it might have been, for it contains nothing either improbable or impossible; but when Jotham went up to the top of Mount Gerizim and spoke to the men of Shechem about the trees going forth to anoint a king over them, he made use of a fable proper. The peculiarity, therefore, of the *structure* of the fable consists in the transference to inanimate objects, or, more frequently, to the lower animals, of the qualities of rational beings. By the very novelty and utter impossibility of the representation, the interest of the hearer or reader is excited, and thus its symbolic meaning and moral become transparent to him, at least if the fable is well contrived. The ancient fabulists were simple, clear, and earnest in their representations. They seem to have sprung up in the East. Among the more celebrated are Bidpai (q.v.), or Pilpai; and the Arabian Lokman, said to have lived in the time of King David. Among the Greeks, the greatest fabulist is Æsop (q.v.), whose fables, at a much later period—the precise time is not exactly known—were versified by a certain Babrius (q.v.). Among the Romans, Phædrus cleverly imitated Æsop, but with considerable modifications, thus giving some independent value to his work. The well-known fable of the *Town Mouse and Country Mouse*, told by Horace, is of purely Roman origin, and is probably the only one in existence of which that can be affirmed. Leaving the classical period, and before entering on the dark ages, we encounter the name of Aphthonius, in the early part of the 4th c., who wrote inferior fables in Greek prose; and still later, the name of Flavius Avianus, who composed 42, no better, in Latin elegiacs. During the dark ages, the fable in various forms appears to have been cultivated in the monasteries, though nothing meritorious has survived; but in the middle ages, it acquired fresh life and vigor. An

FABLIAU.

edition of the fables current in Germany in the time of the Minnesingers has been published by Bodmer. The oldest known German fabulist is Stricker, about the middle of the 13th c.; but the famous mediæval fable of *Reineke Fuchs*, or the History of Reynard the Fox (q. v.), stretches in some of its numerous primitive forms much further back. In later times, most nations have cultivated the fable with more or less success; among the English, Gay; among the Germans, Hagedorn and Gellert, and Lessing; among the Italians, Pignotti; among the Russians, Krylov; and above all, among the French, La Fontaine, whose fables are remarkable for their arch and lively humor, their delicate sarcasm, their sagacity, and felicity of expression. Now, however, the fable has gone out of fashion.—*SYN.* of 'fable, n.': parable; allegory; fiction; fabrication; novel; romance; story; tale; apologue; untruth; invention.

FABLIAU, plur. FABLIAUX, *făb-lě-ō* [from Latin *fabulari*, *fabellare*, to speak or to tell]: name given in the old French literature to a class of short metrical narratives, intended merely for recitation, which had for their subject-matter the talk and news of the day in the middle ages. The narrator of such news was called a *fableor* (plur. *fablière*), in opposition to the *chanteor*, or singer proper, who composed poems not only for recitation, but also for singing. Besides the fabliaux, the department of the *fableor* embraced the *Romans d'aventure* (in short unstrophied couplets), usually called *contes*, whence their author or reciter also bore the name of *conteur*; and the *dits*, or sayings, the special cultivator of which was termed a *diseur*. As the fabliaux were fundamentally distinguished from the more genuine forms of poetry by the everyday character of their subject-matter, so the mode of treatment which their authors adopted was also more anecdotal, epigrammatic, and witty—the wit being richly spiced with scandal. They appear to have maintained a sort of ironical and parodistic antagonism to the idealism of the epics of chivalry. In these fabliaux, the essential character of the French people manifested itself, with that opposition of the real to the ideal, of the understanding to the imagination, which, after the time of Francis I., began to characterize French literature generally. Thus they lashed not only the priesthood and the nobility in their actual degeneracy, but from the very character of their satire, they engendered a contempt for the religious-chivalric spirit itself, and for all ecclesiastical and knightly notions and ceremonies. The oldest fabliaux are not of French origin; they are a fruit of the Crusades, and were brought to France from the East, but they received a national coloring, and soon took root in the West. From them sprang the drama of France. One of the most fecund *fablière* was Rutebeuf, who lived in the reigns of Louis IX. and Philippe III., whose works were published by Jubinal (2 vols., Paris 1837). He was a true Parisian, and the prototype of Villon, La Fontaine, and Voltaire. The best collections of fabliaux and *contes* are those of Barbazan (§

FABRETTI—FABRIANO.

vols., Paris 1756), of Méon (2 vols., Paris 1823), and of Jubinal (2 vols., Paris 1839-43).

FABRETTI, *fâ-brêl'tê*, RAFFAELE: antiquary and archæologist: 1618-1700; b. Urbino. He was attracted at an early period to antiquarian studies by the great classical remains of Rome. Under Pope Alexander VII., he became papal treasurer, and subsequently was chancellor to the papal embassy at Madrid. A residence of 13 years in Spain enabled him to explore all the antiquities of the kingdom, and to carry his studies to a point which rendered indispensable his return to Rome, the great parent fount of ancient learning. He was there made judge; and under Innocent XII., became keeper of the papal archives of the castle of St. Angelo, a post which afforded the widest scope to his favorite pursuits. About this time, he wrote his two important works: *De Aquis et Aquaductibus Veteris Romæ* (4 vols. 1680, reprinted with notes and additions 1788), and *Syntagma de Columnâ Trajani* (Rome 1683). His treatise entitled *Inscriptionum Antiquarum Explicatio* (1699) throws invaluable light on the discoveries made by himself in the catacombs; and his erudite investigations concerning the reliefs known as the Iliac Tables, and the grand subterranean canals of Emperor Claudius, are equally full of interest to science. His rare collection of inscriptions, etc., is in the ducal palace of Urbino.

FABRIANO, *fâ-brê-â'nô*: city of Italy, province of Ancona (formerly part of the Papal States), at the base of the Apennine range, 28 m. w. of Macerata. It has a cathedral, and several convents, but is notable chiefly for its great paper manufactures, established 1564. The churches and private houses contain many specimens of the school of painting which flourished here.—Pop. 7,500.

FABRIANO, GENTILE DA: Italian painter, in the early part of the 15th c.; b. at Fabriano; d. some time after 1450. He received his first instructions from his father, who appears to have been a man of superior culture, as he taught his son the elements of physics and mathematics. F.'s first teacher in art was, it is supposed, Allegrette de Nuzio. Subsequently, he went to Florence, and studied under Fiesole. Among his earliest works of note is a fresco of the Madonna in the cathedral of Orvieto. In 1423, he painted an 'Adoration of the Kings' for the church of the Holy Trinity in Florence. This picture is one of the most admirable belonging to the school of Giotto. To the same period belongs a Madonna with Saints (now in the Berlin Museum). F. afterward went to Venice, where he greatly increased his reputation by a picture of the bloody engagement between the fleet of the Republic and that of the Emperor Barbarossa off the heights of Pirano. The Venetian senate was so delighted with the piece, that it conferred on the fortunate artist the dignity of a patrician, and a pension of a ducat *per diem* for life. Unhappily, this work has perished. Pope Martin V. then called F. to Rome, and employed him, with Vittore Pisanello, in adorning the church of St. Giovanni Laterano. As his share of

FABRIC—FABRICIUS.

the work, he painted various incidents in the life of John the Baptist, five prophets, and portraits of Pope Martin himself and ten cardinals. He died, while engaged on this building. F.'s pictures indicate a cheerful and joyous nature. He had a childlike love of splendor and rich ornamentation, but is never extravagant or excessive in his coloring.

FABRIC, n. *fäb'rik* [*F. fabrique*—from *L. fabrica*, the art or trade of an artisan, a workshop: comp. *fäciö*, I make]: a building; the structure of anything; texture. **FABRICATE**, v. *fäb'ri-kät* [*L. fabricatus*, constructed]: to invent; to devise falsely; to frame; to construct. **FABRICATING**, imp. **FABRICATED**, pp. **FABRICATOR**, n. *-tär*, one who. **FABRICATION**, n. *-kä shün* [*F.—L.*]: the act of framing or constructing; that which is framed or invented; a falsehood; forgery. —**SYN.** of 'fabric': structure; construction; edifice; workmanship; framework;—of 'fabrication': see under **FABLE**.

FABRICIUS, *fä-brish'üs*, or **FABRIZIO**, *fä-brüt'sē-ö* GIROLAMO, commonly named from his birthplace **FABRICIUS AB ACQUAPENDENTE**: anatomist and surgeon; 1537-1619. He was the son of humble parents, who, notwithstanding their poverty, sent him to the Univ. of Padua, where, in addition to the usual instruction in the classics, he studied anatomy and surgery under the celebrated Fallopius with such success, that on the death of the latter 1562, F. was appointed to the vacant professorship, which he held for nearly half a century, attracting students from all parts of the civilized world. Among these students was Harvey (q.v.) in 1598, who derived from F.'s observations on the valves of the veins the first clue to his great discovery. He was a most laborious investigator of anatomy, and on a more methodical plan than had been attempted by his predecessors. He treated of the eye, the larynx, the ear, the intestinal canal, the development of the fetus, and many other subjects. He introduced great improvements in the practice of surgery; and his *Opera Chirurgica* passed through 17 editions. He wrote numerous other surgical works: all were collected and published by Albinus 1723, more than a century after his death. The Venetian republic erected for him a spacious anatomical amphitheatre, in which his name was inscribed, and at the same time conferred upon him an annual stipend of a thousand crowns, and created him a knight of the order of St. Mark. A few years before his death, he retired from professional duties, and died (some believe he was poisoned by his relatives) in his villa on the banks of the Brenta, which still bears the name of the Montagnuola d'Acquapendente.

FABRICIUS, *fä-brüt'sē-üs*, **JOHANN CHRISTIAN**: 1745, Jan. 7—1807; b. Tondern: Danish entomologist. He studied at Copenhagen, Edinburgh, Leyden, and Freyburg, and finally at Upsala, under Linnæus, whose ideas F. was zealously employed throughout his life in developing and applying. In 1775, F. was appointed to the chair of natural history at the Univ. of Kiel, and from that time applied himself to the fuller development of a system of classifica-

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tion of insects, based upon the structure of the mouth. Although his system has been found inapplicable to many families of insects, it has been instructive. The *Systema Entomologicæ* (Copenh. 1775), in which F. expounded his views, constituted a new era in entomology, and his *Genera Insectorum* (Kiel 1776), *Mantissa Insectorum* (Copenh. 1787), and *Entomologia Systematica* (Copenh. 1792), opened new fields to the entomologist. F. was the author of several able treatises on the policy, statistics, and economy of Denmark, prepared in his capacity of councilor of state and prof. of rural and political economy at Kiel. F.'s death at Kiel, was said to have been hastened by his grief at the political misfortunes of his country.

FABRILE, a. *fäb'rîl* [L. *fabrilis*—from *faber*, a workman; Sp. *fabril*; It. *fabbrile*]: pertaining or relating to workmen or to handicraft, as in wood, stone, metal, etc.

FABRONI, *fä-brō'nē*, ANGELO: 1732, Feb. 7—1803, Sep. 22; b. Marradi, Tuscany: biographical writer. He was educated at Faenza and Rome, and 1773, was appointed tutor to the sons of Leopold, Grand Duke of Tuscany. His *Vite Italarum Doctrina Excellentium qui Sæculo XVII. et XVIII. floruerunt* (20 vols. Pisa 1778-1805), is one of the best Italian works of its kind, and is a treasure of information; while his *Laurentii Medicei Vita* (2 vols. Pisa 1784), *Vita Magni Cosmi Medicei* (2 vols. Pisa 1788-9), are reckoned model biographies.

FAÇADE, n. *fä-säd'* [F. *façade*, the front—from It. *facciata*, the front of a building—from *faccia*, the face—from L. *faciēm*, the face]: exterior front or face of a building. This term, frequently restricted to classic architecture, may be applied to the front elevation of a building in any style, though generally referring to buildings of some magnitude and pretensions; thus, we speak of the *front* of a house, and the *façade* of a palace. The back elevation of an important building is called the rear *façade*, in the same inapt way as in England the back of a house is called the '*back-front*.' An edifice may have any number of *façades* when it shows a face or front in each direction. An elevation of the side of a building is called by some *lateral façade*. The sides of a court or cortile also are called *façades*, and are distinguished as north, south, etc., *façades*.

FACCIOLATI, *fät-cho-lä'tē*, JACOPO: 1682-1769; b. Torreglia, not far from Padua: Italian philologist and critic. He was educated in the religious seminary at Padua, where he became successively prof. of theology, prof. of philosophy, and supt.-gen. of the classes, or rector of the institution. F. directed his attention chiefly to the revival of the study of ancient literature, and brought out a new edition of *Lexicon Septem Linguarum*, called, from its original author, the monk Ambrosius of Calepio, the *Calepine Lexicon*. He was assisted in this work by his pupil, Forcellini, to whom mainly is owing the conception of a totally new Latin dictionary; an arduous undertaking, which F. continued till his death and which was completed by Forcellini 1771. F. and Forcellini, assisted by

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several others, likewise published a new ed. of Nizoli's *Thesaurus Ciceronianus*. F.'s Latin epistles and orations are remarkable for the Ciceronian elegance of their style, and his notices on several philosophical writings of Cicero for their solidity, clearness, and taste.

FACE, n. *fās* [F. *face*—from L. *faciēs*, a face, a visage]: the front or surface of anything; appearance; the countenance; look; visible state of affairs; freedom from bashfulness or confusion; boldness; presence or sight, as before the face: V. to meet in front; to meet and oppose with firmness; to cover with an additional surface; to make a false appearance; to stand opposite to. **FACER**, n. *-ēr*, blow in the face; a sudden blow, check, or hindrance. **FA'CING**, imp. fronting or opposite: N. a thin covering placed in front for improvement or strength; a thin covering for ornament. **FA'CINGS**, n. plu. the movements of soldiers to make a front, to the right, to the left, etc.; the collars, lappets, cuffs, etc., of a regimental uniform, which are of distinctive colors. **FACED**, pp. *fāst*. **FACE'LESS**, a. without a face. **FA'INGLY**, ad. *-lī*. **TO SET ONE'S FACE AGAINST**, to oppose. **TO MAKE FACES**, *-fāsēs*, to distort the face. **FACE TO FACE**, in immediate presence. **TO FACE THE ENEMY**, to meet him in front with determination. **TO FACE IT OUT**, to maintain confidently and without change of color, generally in a bad sense; to pass through the ordeal of a disagreeable personal interview with courage. **FACET**, n. *fās'ēt* [F. *facette*, a little face]: a little face; a small plane surface, as of a crystal or a cut gem. **FAC'ETED**, a. having numerous small surfaces or faces, as cut gems. **FACIAL**, a. *fā'shal* [L. *faciēs*, the face]: of or pertaining to the face. **FACIAL ANGLE**, the angle formed by two lines, one drawn horizontally from the nostrils to the ear, and the other upwards from the nostrils to the most prominent part of the forehead (see **ANGLE**). **FACIALSNEURALGIA**: see **NEURALGIA**.—**FACIAL PARALYSIS**, paralytic of the facial nerve, involving loss of power over the muscles of the face. It may affect either side, or both sides, and is attended with loss or partial loss of the power of articulation. **FACIES**, n. *fā'shī-ēz* [L.]: in *nat. hist.*, any common resemblance or aspect among the rocks, plants, animals, or fossils of any area or epoch.

FACETIOUS, a. *fā-sē'shūs* [F. *facétieux*, facetious—from L. *facētūs*, witty or clever things—from L. *facētūs*, courteous, witty: It. *faceto*]: sprightly with wit and good-humor; gay; full of pleasantry; jocular. **FACETIOUSLY**, ad. *-lī*. **FACE'TIOUSNESS**, n. *-nēs*, pleasantry; sportive humor. **FACE'TLÆ**, n. plu. *-shī-ē* [L.]: witticisms in speaking or writing.—**SYN.** of 'facetious': jocose; sportive; merry; pleasant; witty.

FACIAL: see under **FACE**.

FACILE, a. *fās'īl* [F. *facile*—from L. *facilis*, easy: It. *facile*]: easily persuaded; flexible; yielding; not difficult. **FACILITY**, n. *fā-sīl'ī-tī* [F. *facilité*—L.]: ease or readiness in performing; the means by which performance is rendered easy; dexterity; pliancy; readiness in compliance, in a bad sense. **FACILENESS**, n. *fās'īl-nēs*, easiness to be persuaded

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or overcome. **FACILITATE**, v. *fǎ-sǐl'í-tāt*, to make easy or less difficult; to lessen the labor of. **FACILITATING**, imp. **FACILITATED**, pp. **FACILITATION**, n. *-tǎ-shün*. **FACILITIES**, n. plu. *-tiz*, the means by which the doing is rendered easier; convenient advantages. **FACILE PRINCEPS**, phrase, *fǎs'í-lě prín'sěps* [L. easily first or best]: able to surpass all competitors without exertion.—**SYN.** of 'facility': ease; easiness; expertness; readiness; affability; condescension; complaisance; ductility.

FACILITY, in the Legal Terminology of Scotland: condition of mental weakness short of that which will justify *Cognition* (q.v.), but which calls for the protection of the law through a process called Interdiction (q.v.), whose object is to prevent the facile person from granting deeds to his own prejudice. See **FRAUD: LESION: INSANITY**. There is no corresponding term in English law, or in that of the United States; but weakness of mind approaching to idiocy is an important element in proving fraud.

FACINGS, n. *fǎ'sings*: see under **FACE**.

FACINOROUS, a. *fǎ-sín'ō-rūs* [L. *facinorōsus*, criminal, vicious—from *facinus*, a crime]: in *OE.*, wicked; criminal; vicious.

FAC-SIMILE, n. *fǎk-sím'í-lě* [L. *fac*, make; *factus*, made; *similis*, like]: an exact copy or likeness; an accurate imitation of an original.

FACT, n. *fǎkt* [L. *factum*, a thing done—from *facēre*, to do; F. *fait*, a fact]: anything which is done; an event; a deed; a reality; truth. **IN FACT**, in reality, as opposed to supposition. **MATTER-OF-FACT**, prosaic or material, as opposed to fanciful or poetical.—**SYN.** of 'fact': act; performance; incident; occurrence; circumstance; situation.

FACTION, n. *fǎk'shün* [F. *faction*—from L. *factiōnēm*, a making, a siding with any one—from *facēre*, to make or do]: a party in turbulent or disloyal opposition; a cabal; dissension. **FACTIONIST**, n. one who acts unscrupulously in opposition. **FAC'TIOUS**, a. *-shūs*, turbulent; pertaining to or given to faction. **FAC'TIOUSLY**, ad. *-lī*. **FAC'TIOUSNESS**, n. disposition to raise opposition on frivolous grounds.—**SYN.** of 'faction': combination; party; clique; junto; conspiracy; plot.

FACTITIOUS, a. *fǎk-tísh'ūs* [L. *factitiūs*, made by art, artificial—from *facēre*, to make; F. *factice*; Sp. *facticio*]: artificial; made by art; not natural. **FAC'TIOUSLY**, ad. *-lī*. **FAC'TIOUSNESS**, n.

FACTITIVE, a. *fǎk'tí-tív* [L. *factitūs*, made or done frequently—from *factus*, made, done]: applied to a verb in which the action expressed produces some change in the object, as, 'He made the water wine.'

FACTOR, n. *fǎk'tér* [L. *factor*, a maker or doer—from *facēre*, to make; F. *facteur*]: an agent employed by merchants or proprietors to do business for them, or to sell their goods on commission; in *Scot.*, a land-steward; in *arith.*, a multiplier or multiplicand; one of the parts which multiplied together produce a product. The numbers

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6 and 4, multiplied together, *make* 24; hence 6 and 4 are called *factors* of the product 24. Every product can be divided by any of its factors without remainder; a factor, therefore, is often called a *divisor*, or measure: 2, 3, 4, 6, 8, 12, all are factors or divisors of 24. Numbers that have no factor or divisor above unity, such as 2, 3, 5, 7, 11, . . . 23, etc., are called *Prime Numbers*: see NUMBERS, THEORY OF. FACTORAGE, n. -áj., the allowance or commission given to a factor. FACTORSHIP, n. the business of a factor. FACTORY, n. fák'tér-í, a place where goods are manufactured; the place where factors reside or keep their goods—applied to commercial stations abroad. FACTORIAL, a. fák-tó'rí-ál, pertaining to a factory; an element in a computation; an agent in a result. FACTORIZE, v. fák'tér-iz, in *law*, to warn not to pay or give up goods; to attach the effects of a debtor in the hands of a third person.

FACTOR, in Commerce: in general one engaged to do business for another. Factors and brokers are commercial agents employed to buy and sell for third parties, and usually paid by commissions on their transactions. To a F. the goods themselves, termed a 'consignment,' are intrusted for the purposes of a sale, while a broker, without taking possession or exercising control over the goods, negotiates sales or purchases of them. The term 'factor' is used comparatively seldom in the United States, that of 'commission merchant' being generally employed. The same person sometimes acts in the capacity of F. and broker, but in addition to the differences above noted, there are others. There is nothing to prevent the F. from buying and selling in his own name, but the broker is bound, unless otherwise authorized, to buy and sell in the name of his principal. The F. has a lien upon the goods for his advances and commission, but the broker has no lien. Neither F. nor broker has, in the absence of trade usage permitting it, the right to delegate his authority to anybody else unless authorized by the principal. When the F., for an increased compensation, guarantees the payment of sales made by him, he is said to receive a *del credere* (borrowed from the Italian, and equivalent to guaranty or warranty) commission (see DEL CREDERE COMMISSION). When the F. resides in the same state or country as his principal, he is spoken of as a home or domestic F.; residing in a different state or country he is known as a foreign F. A F. is generally authorized to sell on credit, but must be very vigilant that no loss occurs to the principal by reason of bad debts which care and attention might have prevented. As between himself and third parties, the F. is treated as the owner of the goods consigned to him. He has the right to insure such property, though ordinarily he is not bound to do so without agreement express or implied to that effect. A F. is required to keep the goods entrusted to him with the same care that he would use respecting his own.

Under the English common law, pledges of goods by a

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F. without authority from the principal were invalid. To modify this rule statutes have been enacted in England, viz. 6 Geo. IV. chapter 94 (1825) known as the Factor's Act, and 5 and 6 Victoria, chapter 39 (1842), and also in the United States, protecting persons, who, relying upon the F.'s apparent ownership and possession of the goods, in good faith advance money to him thereupon.—See AGENT: JUDICIAL FACTOR.

FAC'TORY: establishment where large numbers of persons co-operate in the production of some article of consumption, the principle of the division of labor being in all cases applied, generally with machinery to a greater or less extent. The F. system is opposed to the practice of individual labor at the homes of the artisans. Every production of art requires a longer or shorter series of operations, often varying considerably in their nature. The hand-worker performs most of these himself; usually the same person begins and completes the article. In a F., every article goes through as many hands or machines as there are separate processes required; each workman performs only one, and that always the same, process. The chief advantages of this way of proceeding are the following: Loss of time is avoided in passing from one operation to another, a loss which is the greater, the greater the difference in the nature of the operation. The workman, confined to one thing, in itself usually simple, not only learns it sooner, but attains a quickness and skill that one distracted with a variety of operations can never attain; besides, the constant occupation with one kind of work leads the workman to improvements in tools and machines which increase rapidity of execution and precision. As only few of the processes are very difficult, it is possible to turn to some account less skilful workmen, and even children, and to assign to each person that kind of work at which he is most effective. All parts of the work, too, that are quite uniform in the case of each article, can generally be done by machinery. Lastly, in factories, there is more opportunity of turning to advantage all kinds of refuse.

A necessary consequence of these advantages is, that the cost of production is less on the F. system than in the other way; also, the articles themselves, when of a nature adapted to this mode of production, are better, and of a uniformity otherwise unattainable. Wherever a comparatively homogeneous material has to be made into a large number of uniform articles, there the F. system is in its proper place. The best examples are spinning, weaving, cloth-printing, pin and needle making, etc. But even in the manufacture of complex articles of different kinds of material, the F. system may be pursued with advantage whenever the number of the articles required is great, and the separate parts of such a kind that a great number can be made exactly alike. This is the case with watches, weapons, locks, etc. Such a manufacture divides itself into as many separate employments as there are parts in each article, and the putting together and adjusting (the

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'assembling') forms another. The degree of complexity is carried still further in such cases as the manufacture of carriages, where operations of the most heterogeneous kind concur. In some cases, factories do not concern themselves with the putting together of the parts, but merely produce them for hand-workers and special professionalists, as in watch-making. In making clothes and shoes and the like, where each individual article requires special adaptation, F. work is not so entirely suitable. Nowhere have the F. system and the employment of machinery been carried further than in the United States; for instance, one establishment has produced 200 dozen chairs a week, another 1,000 bedsteads, most of the work being done by machinery; and one boot and shoe factory has used 600 bushels of shoe-pegs. Even the killing of pigs is done on this grand scale, one firm at Chicago killing and packing 373,725 hogs in four months.—Factories cannot succeed in great numbers except where the population is sufficiently dense to afford a choice of workers, and also—if there be sharp competition in the production—to prevent too high a rate of wages. Other conditions of a good locality for F. production are, abundance of water-power or the presence of coal for steam power, nearness to the raw material, and good communications.

While the rise and extension of the F. system, viewed from the point of material economics, must be pronounced a decided improvement, it cannot be denied that, socially and politically considered, it has its dark side. The greater the capital and the training necessary for carrying on an extensive establishment, the less prospect the workman has of raising himself to independence. The chasm that separates the mill-owner from his dependants is far greater than that which exists between a master artisan and his journeymen. The hope of gradual advancement afforded in the last case supplies a powerful moral support and means of discipline; the impassable gulf in the other, acts as a stumbling-block and temptation. F.-workers are especially disposed to enter heedlessly into marriage, as they require to make no provision for a workshop, tools, and other outlay formerly necessary for entering life; while they have the prospect of the wife, and soon of the children, as contributors to the support of the family. It may, at all events, be affirmed, that the increase and accumulation in masses of the class called *proletaires*, who have no provision for a week but the labor of that week, is favored by the F. system. Moreover, the employment of wife and children as fellow-laborers endangers the bonds of the family; the father can no longer remain master of the house of which he is no longer the sole support; and how much the family affection is thus weakened, is painfully exhibited in the ill-treatment of the younger children, who are prematurely put to labor. At the same time, these evils are not incapable of remedy; nor must it be forgotten that the evil is not peculiar to F. labor, but is a feature of the whole system of recent industrial economics. The very circumstances that give rise to the evils, afford the

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means of obviating them, if they were only taken advantage of; for, the larger the establishment, the more good can an owner do for his people, and the less it is possible to conceal abuses.

FACTORY ACTS: laws in the interest of workers in factories. The development of the textile industries toward the end of the 18th c., in England, led to the employment of a great many children, sent by the Poor Law authorities from the southern agricultural counties to the districts of Derbyshire, Nottinghamshire, and Lancashire. These children were ill looked after, and the mills generally overcrowded. In 1802, the Morals and Health Act was passed. The introduction of steam led to the Cotton Mills Act, 1819, which fixed the working age of children at nine years, and the working week for them at 72 hours. The Saturday half-holiday did not come until Sir John Hobhouse's Act of 1825. Richard Oastler, the 'Factory King,' was then spreading through the woolen districts of Yorkshire the agitation for the Ten Hours Bill. The Cotton Industry Act, 1831, may be called the first Factory Act; but it was carried out very imperfectly, the men often being compelled to support a fund, out of which the employers' fines were paid. Tom Sadler's Ten Hours Bill, 1832, was lost through the opposition of the manufacturers; and Lord Ashley's Bill, which restricted the working hours of adults, was met by the appointment of a royal commission (1833-4), whose report took the view of the capitalists, that such a restriction would so diminish production as to put them at the mercy of foreign competition. On its recommendations was based Lord Althorp's Act (3 and 4 Will. IV. c. 103), which first made the distinction between children and young persons, and began the system of working children in relays, so as to permit daily education. A singular division of political parties took place on the factory question at this time; the chartists and the conservative protectionists favoring the demands of the artisan class against the whig capitalists and the Anti-Corn-Law League. The first fruit of Lord Ashley's Children Employment Commission was the Mining Act, 5 and 6 Vict. c. 99, which prohibited work underground to women and boys under ten years of age. The alternate day system (with an extension of the hours for schooling) was further developed in the important Factory Act, 1844. A uniform working day, from 6 A.M. to 6 P.M., with a fixed $1\frac{1}{2}$ hour for meals, was at last established for all protected persons by the act 13 and 14 Vict. c. 54. The children's working day was still regulated by the act of 1844; and as this interfered with education under the 'alternate day' system, the anomaly was removed by the act 16 and 17 Vict. c. 104. Manual work had been diminishing in many trades; and in 1861 several restrictions were placed on lace factories and on bake-houses. The next general movement, however, was entirely due to the great Commission of Inquiry, the appointment of which Lord Shaftesbury moved 1861. Their recommendations were well received by the employers, who were now more alive to the advantages connected

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with sound sanitary conditions for labor. In 1876 the Royal Commission on Factory and Workshop Acts reported that previous legislation had been to a large extent successful; and that, while some occupations were still undoubtedly unhealthful in spite of the sanitary regulations of these acts, the cases in which young children were employed in labor unfitted for their years, or in which young persons and women suffered physically from overwork, had become uncommon. The commissioners, however, proposed large changes in the law, and in particular they proposed the consolidation of the law, then dispersed through 15 statutes—one passed 1802, requiring all apprentices in cotton and woollen factories to be instructed in the principles of the Christian religion. This consolidation has been accomplished by the Factory and Workshop Act, 1878, 41 Vict. c. 16, which deals with five classes of works: (1) Textile factories, which remain very much under the regulations enacted by the Factory Acts of 1844, 1861, and 1874; (2) Non-textile factories, which include the occupations enumerated in the Factory Acts Extension Act, 1864, and the Workshops Act, 1867, whether using mechanical power or not, and also all occupations, not named in these acts, in which mechanical power is used; (3) Workshops, or all unnamed occupations, in which mechanical power is not used, except those named in the acts of 1864 and 1867; (4) Workshops in which none but women above the age of 18 are employed; (5) Domestic workshops, in which the work is carried on in a private house, room, or place in which the only persons employed are members of the same family dwelling there. In class (1), where power is used, and the large majority of workers are women and children, the highest degree of regulation is reached. In class (2), where the labor is not so hard, or the strain of attendance on the moving power not so heavy, the statutory hours of work are somewhat relaxed, but education and sanitary provisions are still compulsory. In class (3) registers of children and young persons, and certificates of age and fitness, are, except in special circumstances, dispensed with. In class (4), the hours for work and meals may be changed, and the sanitary authority is responsible for the sanitary state of the shop. In class (5), there is still greater elasticity as regards hours for work and meals; the medical officer of health inspects the sanitary condition, but the employment of women is entirely unrestricted. A place used solely as a dwelling, a part of a factory used solely for some purpose different from the process carried on in the factory, and a school, are not considered workshops or factories. Straw-plaiting, pillow lace-making, glove-making, and some other handicrafts of a light character, may be carried on by a family in a private house or room, without fixing on the premises the legal liability of a workshop. Again, if the manual labor is exercised only at irregular intervals, and does not furnish the principal means of living to the family, the house will not become a workshop. The act does not apply to persons engaged merely to repair machinery in a factory.

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In considering the main provisions of the Act of 1878, it must be kept in view that a 'factory' means a place in which machinery is moved by the aid of steam, water, or other mechanical power; a 'child' means a person under the age of 14 years; a 'young person' means a person between 14 and 18 years of age; a 'woman' means a woman of 18 years and upward; 'parent' includes the person having the custody or control of any child; 'night' means the period between 9 P.M. and 6 A.M. The general *sanitary provision* applicable to all factories and workshops is, that they shall be clean, free from effluvia, not overcrowded, and ventilated so as to render harmless, so far as practicable, the injurious gases, vapors, dust, etc., generated in the process. Where anything is wrong, the factory inspector gives notice to the sanitary (local) authority. Every factory is to be lime-washed once in 14 months, unless painted in oil once in 7 years, when it must be washed once in 14 months. The inspector may order fans to be used where dust is generated by grinding, glazing, or polishing on a wheel. Special provision is made for the painting of bakehouses, and for the protection of workers in the wet-spinning process. The obligation to fence factory machinery in an efficient manner applies to every hoist or teagle near to which any person is liable to be employed, every fly-wheel connected with mechanical power, every part of a steam-engine and water-wheel, and every wheel-race. The inspector may also require the fencing of any driving strap, or band, or other part of machinery which he considers dangerous, or of any vat, pan, or other structure filled with hot liquid or molten metal so as to be a likely source of danger to the protected classes. Children must not be set to clean any part of the machinery while in motion; as regards young persons and women, the prohibition extends only to mill-gearing. No work is to be done between the fixed and traversing parts of a self-acting machine while moved by mechanical power. The general rules for hours of employment of young persons and women in the textile factories are 6 A.M. to 6 P.M., or 7 A.M. to 7 P.M., except on Saturdays, and on Saturdays 6 A.M. to 12.30 or 1 P.M. (according to the time allowed for meals), or 7 A.M. to 1.30 P.M. Two hours (one of them before 3 P.M.) must be allowed for meals on every day except Saturday, on which half an hour is sufficient. The employment is not to be continuous more than $4\frac{1}{2}$ hours without an interval of half an hour for meals. The variations on these rules for young persons and women in a non-textile factory, and for young persons in a workshop, are that the minimum time for meals is reduced to $1\frac{1}{2}$ hour, and the period of continuous employment is extended to 5 hours. As regards children in textile factories, they must be employed on the system of morning and afternoon sets, or on that of alternate days. Their morning set ends at 1 P.M., or dinner-time, if that is earlier; the afternoon set begins at 1 P.M., or after dinner, if that is later. The Saturday hours for children are the same as for others. Neither set is to be continued more than seven days, and

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no child may be employed on two successive Saturdays. Under the alternate day system, the hours for employment and meals are the same as for young persons. In workshops in which neither children nor young persons are employed, the hours for women are 6 A.M. to 9 P.M., with $4\frac{1}{2}$ hours for meals and absence for work; and on Saturdays, 6 A.M. to 4 P.M., with $2\frac{1}{2}$ hours for these purposes. As regards *domestic* workshops, the most important speciality is that the alternate system for children may not be used. The actual times for work and meals are not fixed, but overtime is prohibited, and the shops are under the sanitary supervision of the local authority. The two points fixed by statute with reference to meals in factories and workshops generally are: That the three classes of children, young persons, and women must have their meals at the same hour; that during that hour none of them is allowed to remain in a room where the manufacturing process is being carried on. In every factory and workshop the period of employment, prohibitions, meal hours, and system of children's labor, all must be published in a notice put up within the premises. Employment of children under the age of ten, and of any of the protected classes on Sunday, is prohibited. The occupier is also bound to give eight half-holidays in every year besides (in Scotland) the sacramental fasts. In trades carried on in connection with the retail business, the home secretary may authorize the giving of separate holidays to different classes of workers; and in other cases (e.g. in provincial towns where Saturday is the market day) he may substitute another week-day for the Saturday half-holiday. A child, employed on the morning and afternoon set, must give one school attendance on each work day, and, if employed on the alternate day system, two school attendances on each non-working day. The penalty is that the child cannot be employed in the following week before the deficiency in school attendances has been made up. It is the duty of the employer to get every week from the teacher a certificate of attendance. He may also be obliged to pay to the school-manager a sum not exceeding 3*d.* a week, or one-twelfth part of the child's weekly wages. A child of 13 years, however, on obtaining a certificate of proficiency, will be treated as a young person. No child or young person under the age of 16, is to be employed in a factory more than seven days without a certificate of age and physical fitness granted after personal examination by the medical officer or certifying surgeon of the district. When an accident occurs in a factory or workshop which causes loss of life, or prevents the person injured resuming work within 48 hours, notice must be given to the inspector and the medical officer or certifying surgeon, the latter of whom must go at once to the premises and report to the inspector on the nature and cause of the death or injury.

The Act imposes numerous special restrictions. For instance, no children or young persons are allowed to work at silvering mirrors by the mercurial process, making white lead, melting or annealing glass. Children must not be

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employed in dipping lucifer matches, or dry grinding in the metal trade. Girls must not be employed in making or finishing bricks or salt. In glass and earthenware works and others, certain parts of the works must not be used for taking meals. The home secretary has power to extend such restrictions to other unwholesome occupations. Again, where the customs and exigences of a trade require it, the home secretary may alter the hours of labor to 8 A.M. and 8 P.M., or even 9 A.M. and 9 P.M. Of the first class, lithographic printing, envelope making, biscuit making, and bookbinding are examples; of the second, the straw-hat making at Luton, and warehouses in London and elsewhere. The administration of the Act is carried on by inspectors, appointed and paid by government. They have large powers of entering factories, workshops, and schools, of asking for documents, of examining persons on oath. A special warrant is required to enter a dwelling-house. The inspectors report to government annually. The certifying surgeons appointed by the inspectors are entitled to charge for their statutory duties certain fees, which are paid by the employer, but which he may deduct from wages.

Laws in the United States for protection of Factory Operatives.—Legislation on this subject has not in the United States, assumed so comprehensive a character as in England, largely for the reason, that the evils, to remedy which the first British factory acts were passed, never existed to any such extent as in the old country. Statutes have been enacted in the States of Me., N. H., Vt., Mass., R. I., Conn., N. Y., N. J., Penn., Md., Ind., and O., regulating to a certain degree labor in factories, but still leaving very much of the subject unlegislated upon. These laws regulate principally the age at which children shall be permitted to enter factories and the number of hours they may work daily therein. The age varies in the different states, but 10 years is the earliest at which children are allowed to work. Provision is usually made for compulsory school attendance during at least a portion of the year for children between 10 and 15 years of age. The hours of daily labor of children between 10 and 15 are generally not permitted to exceed 10, in some states 8 being fixed as the maximum. For the special benefit of females working in factories and stores, laws have been enacted compelling employers to furnish seats which they must allow such females to use when the latter are not occupied with their regular duties. For the benefit of both adults and children the laws in some states require employers to provide appliances for the prevention of accidents from dangerous machinery, and owners of buildings to erect suitable exits and fire escapes. Charged with the duty of enforcing the laws, inspectors of factories and public buildings have been appointed. Bureaus of labor statistics, performing very useful services in the collection and dissemination of facts bearing upon the factory system as a part of larger labor questions, have been established in Mass., N. Y., Cal., Mich., Wis., Penn., Miss., O., N. J., Ill., Ind., Io., Md., Kan., Conn., N. C., Me., Minn., Colo., and R. I.; also a

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National Bureau at Washington under the Federal government. (For a very valuable monograph on the factory system in the United States, treating the subject in all its bearings, see Report of Carroll D. Wright, 10th U. S. Census, Vol. II. 531).

Among authorities on this subject, besides the great parliamentary reports of 1841-2, 1862-66, and 1875 are Von Plener's *Die Englische Fabrikgesetzgebung*, of which Mr. Mundella procured a translation 1873; Engels, *Lage der Arbeitenden Classe in England*; Marx, *Das Capital*; Faucher *Etudes sur l'Angleterre*; Alfred's *History of the Factory Movement*; Fielden's *Curse of the Factory System*; Sadler's *Factory System*.

FACTOTUM, n. *făk-tō'tŭm* [L. *fac*, do; *tōtŭm*, the whole]: one who does all kinds of work; a humble friend or confidential servant who is ready to do any kind of work.

FACULÆ, n. plu. *făk'ŭ-lē* [L. *facŭlă*, a little torch: It. *facola*]: spots seen sometimes on the sun's disk, which appear brighter than the rest of its surface: see **SUN**.

FACULTIES, COURT OF: established in the reign of Henry VIII., in England, by acts giving authority to the Abp. of Canterbury and his successors to grant dispensations, faculties, etc., by himself or his sufficient and substantial commissary or deputy, for any such matters not being repugnant to the Holy Scriptures and the laws of God, whereof before such dispensations, etc., had been accustomed to be had at the see of Rome. Up to the time of passing this act, the pope, notwithstanding the statutes which had been passed restraining his authority, continued to exercise his power, and to draw a considerable revenue for indulgences, etc. The chief officer of the court is called *magister ad facultates*. The sittings of the court have always been held at Doctors Commons (q.v.). On its first institution, there were various matters in which the dispensing power was called into exercise—such as the power to hold two or more livings (see **PLURALISM**), and the permission to eat flesh in Lent, etc. But of late years the matter which has chiefly occupied the court has been the granting license to marry without publication of banns: see **LICENSE: MARRIAGE; DISPENSATION**.

FACULTY, n. *făk'ŭl-tŭ* [F. *faculté*—from L. *facŭltătēm*, capability, power—from *facilis*, easy: It. *facolta*]. the power of doing anything; a power or capacity of the mind; ability; skill derived from practice; the professors in a college, or of a department in a university (see **COLLEGE: UNIVERSITY**): an ecclesiastical dispensation. **THE FACULTY**, the medical profession. **FACULTY OF ADVOCATES**, in *Scot.*, the members of the bar, taken collectively (see **ADVOCATES**). **FACULTIES**, n. plu. *-tiz*, powers of the mind, especially of the intellect. Reid considered that the characteristic of a faculty was its *primitive* character, as opposed to the acquired powers, or habits. Sir W. Hamilton remarks on this distinction as follow: 'Powers are *active* and *passive*, *natural* and *acquired*. Powers natural and active are called *faculties*. Powers natural and passive *capacities* or *receptivities*. Powers

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acquired are habits, and habit is used both in an active and passive sense.'—Reid, p. 221. Hence, in discussing the intellect, whatever are considered its primary or fundamental functions, are its faculties. Perception, Memory, Reasoning, Imagination, are the leading intellectual faculties according to the older metaphysicians, who followed the popular classification. These would not now be considered as giving the ultimate analysis of the intellect. Conscience, or the moral sense, has sometimes been called the *moral* faculty: see INTELLECT.—SYN. of 'faculty': power; talent; gift; endowment; dexterity; adroitness; knack; capacity; privilege; authority; license; dispensation.

FAC'ULTY, GRANT OF, BY THE ORDINARY, in the Church of England: order by the bishop of a diocese to award some privilege not permitted by common law. A F. is necessary in order to effect any important alteration in a church, such as the erection of a gallery or of an organ. Without a F., a person is not entitled to erect a monument within the walls of a church. But a monument having been put up, though without a F., cannot be removed till a F. or order to that effect has been obtained. By the common law of England, every parishioner is entitled to a seat in church, but no one has a claim to any particular seat, unless the right has been given by a faculty: see PEWS.

FAD, n. *fād* [colloq., etym. doubtful]: a crotchety; a hobby; a favorite theory or idea.

FADDLE, v. *fād'l* [imitative of rapid movements: Gael. *fadul*, tedious]: to trifle; to toy. FID'DLE-FAD'DLE, n. idle or purposeless action or talk.

FADE, v. *fād* [Dut. *vadden*, to wither—from Sw. *fladra*, to flutter: F. *fade*, insipid, dull]: to decay or wither; to droop; to lose lustre, color, or freshness; to cause to wither; to lose strength; to vanish. FA'DING, imp.: ADJ. subject to decay; liable to lose freshness and vigor; not durable: N. in *OE.*, a kind of ending to a song. FA'DED, pp.: ADJ. become less vivid in color; withered. FADE'LESS, a. that cannot fade. FA'DINGLY, ad. -ly. FA'DINGNESS, n.

FADGE, v. *fāj* [AS. *gefegan*, to join: Gael. *faigean*, a sheath: Dut. *voegen*; Ger. *fügen*, to become, to suit with]: in *OE.*, to suit; to fit; to answer the purpose intended. FADG'ING, imp. FADGED, pp. *fājd*.

FAEBERRY: same as FAYBERRY.

FÆCES, n. plu. *fē'sēz* [L. *fæcēs*, dregs or sediment]: solid excrement; sediment or settlings. FÆ'CAL, a. -kal, relating to excrement.—*Fæces* are matters which an animal ejects from the lower end of the intestinal canal; in greater part, consisting of those portions of food which, on passing through the alimentary canal, have been rejected as comparatively worthless in the office of nutrition. In the higher animals, *fæces* generally contain about three-fourths of their weight of water, the remaining one-fourth consisting, in greater part, of organic remains; in the case of the ox, sheep, and other herbivorous animals, of undigested woody fibre. In the human subject, the quantity of *fæces*

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yielded daily by an average healthy man is 5 to 6 ounces; the peculiar brown color is due to the presence of decomposing biliary matter, and the odor to partially changed nitrogenous substances resembling caseine. The following table gives the composition of human and ox fæces:

Human.		Ox.	
Water,	.78.3	Water,	.70.00
Organic remains,	7.0	Woody fibre,	.22.50
Biliary and nitrogenous		Wax,	0.76
matter,	.14.9	Sugar,	3.00
Albumen,	0.9	Albumen,	2.00
Extract,	2.7	Resin and Salts.	1.74
Salts,	1.2		

For use as manure, these fæces are of little value as compared with guano, dissolved bones, or superphosphates, and, indeed, the principal effete matters of importance to the agriculturist are resident in the urine or liquid excrement of the higher animals. In the case, however, of birds and reptiles, the urine and fæces are voided together more or less moist, and hence the richness of such excrementitious matter, and its high agricultural value: see GUANO. The following table gives the composition of the fæces of the *boa constrictor*.

Uric acid.....	90.16
Ammonia.....	1.70
Potash.....	3.45
Sulphate of potash.....	0.95
Phosphate of lime, etc.....	0.90
Mucus and coloring matter.....	2.94
	100.00

FÆCULA, n. *fæk'ū-lă*, **FÆCULENT**, **FÆCULENCE**:
see under **FECULA**.

FAED, *fäd*, **JOHN**: Scottish painter: b. 1820, at Burley Mill, in the stewartry of Kirkcudbright, where his father was an engineer and millwright. When but just entered on his teens, he was in the habit of making tours through the villages of Galloway, painting miniatures. In 1841, he came to Edinburgh, where his talents ultimately won high reputation. His first picture that obtained great popularity was *The Cruel Sisters* (1851). Since then, F. has executed, among other works, *Shakspeare and his Contemporaries*, *The Cotter's Saturday Night*, and *The Soldier's Return*; and, since coming to London, 1864, *The Wappenschaw*, *The Old Style*, *Tam o' Shanter*, *Haddon Hall of Old*, *The Stirrup Cup*, *John Anderson my Jo*, *The Gamekeeper's Daughter*, and *The Hiring Fair*.

FAED, **THOMAS**: Scottish painter: b. 1826, at Burley Mill; brother of John F. One of his earliest efforts was a drawing (water colors) from the *Old English Baron*. In 1849, he became an assoc. of the Royal Scottish Acad., and soon afterward executed a very attractive work, *Scott and his Friends at Abbotsford*. In 1852, he removed to London, where his *Mitherless Bairn*, 1855, was declared by the critics, 'the picture of the season.' Among his subsequent works are *Home and the Homeless*, *The First Break in the Family*, *Sunday in the Backwoods*, *From Dawn to Sunset*, *Baith Faither and Mither*, and *The*

FAENZA—FAG.

Last o' the Clan. F. was made A.R.A., 1859, R.A., 1864, and elected an honorary member of the Vienna Royal Acad. in 1875.

FAENZA, *fá-ě'n'zá*: town of Italy, 20 m. s.w. of Ravenna, on the left bank of the Lamone, in a beautiful plain. It is in the form of a square divided by four great streets, which meet in the centre. Among the chief buildings are an imposing cathedral, a fine market-place surrounded with arcades and adorned with a fountain, and numerous palaces and ecclesiastical edifices. Its manufacture of glazed and colored earthenware vessels, in Italy called 'Majolica,' and in France 'Faience' (q.v.), has declined in importance, and its chief industry now is the making of silk, linen, and paper. F., anc. *Faventia*, was at one period a town of the Boii, afterward a *municipium* under the Romans, and was annexed to the States of the Church in the 15th c. by Pope Alexander VI., in which condition it remained till 1860, when, with the Emilian provinces, it was annexed to the kingdom of Italy under Victor Emmanuel.—Pop. (1881) 13,998.

FÆSULÆ: see FIESOLE.

FAERY: see FAIRY.

FAG, v. *fäg* [from *flag*, to become flaccid, to be weary: comp. Gael. *faigh*, to get, to obtain]: to work hard and slavishly; to make a drudge of any one; to become weary; to tire out; to fail in strength: N. a hard worker under another; a schoolboy who is the forced drudge of an elder pupil. FAGGING, imp.: N. laborious drudgery. FAGGED, pp. *fägd*. FAG-END [the *lag-end*, the end which *flags* or hangs loose]: the remnant of cloth; the refuse or inferior part of anything; the untwisted end of a rope. To FAG OUT, to untwist; to loose.

FAGGING.

FAG'GING: usage peculiar to the great public schools of England. The origin of the practice cannot be traced. No school statutes refer to it, no school traditions speak of a time when it was not. The statutes of Eton College rather indicate precautions against it, for they ordain that there be 13 poor youths in the establishment to work for the college; but in Edward IV.'s time the college was much impoverished by royal depredations—the fellowships were cut down from ten to seven, and these *pauperes juniores* abolished. However, be the origin what it may, the institution exists in nearly the same form, in all the public schools—Eton, Harrow, Westminster, Winchester, and Rugby. Its main features are in every case much as follows: In each school there are two limits: the upper limit, extending to the bottom of the first one or two forms (the public school designation of classes), below which a boy may not fag; and the lower limit, comprising the last four or five of the lowest forms, above which a boy may not be fagged. The boys between these limits, as also those who, though comprised within the lower limit, have been more than a certain time in the school, are devoid alike of rights and duties in connection with this practice. The services of a fag are of two kinds—the one comprising his duties to a special master, to whom he has been assigned; the other consisting of those due to the whole of the upper boys. The former comprises such tasks as preparing his master's breakfast, stoking his master's fire, carrying his master's messages, and smuggling into the house little forbidden delicacies for his master's consumption, and in this instance, if detected, bearing his master's punishment. Those services which a lower boy owes to the whole of the upper boys, consist of attendance at the games. In the cricket season, the fags perform the functions of a net, and stand behind the wickets to stop the balls while their seniors are practicing; and at all seasons they are liable to the drearier task of waiting attendance on the racket-players, and retrieving the balls which have been 'skied' out of the court. All cases of difficulty arising out of fagging are within the jurisdiction of the head-boy in the house, or the head of the school, and are settled by reference to him. Such are the main features of fagging at the present day—the idea pervading the institution being, that no boy should be liable to the performance of any duties really menial, but only such as, in the absence of the practice, would naturally be performed by each boy for himself. Many of the abuses of this practice which have from time to time been discovered and suppressed, afford whimsical illustrations of the peccant ingenuity of boy-nature. In one school, a senior boy had a study, but was not studious; he might have let it out to a younger boy in want of a crib to read in at a rent of five or ten shillings a term, but his mind soared beyond such paltry dealings; he conceived vaster and grander ideas of the management of his property; he set up a 'tap,' or beer-shop. He smuggled into his room a nine-gallon cask, called a 'governor.' There was a rapid succession of gov-

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ernors, and a brisk demand for beer; so he appointed his fag, a fine stout lad, as deputy-tapster to receive the coppers. The deputy grew attached to both his governors, and flourished long and happily in the faithful discharge of his duties. Another instance consisted of an equally whimsical and widely different exercise of power. A sixth-form boy, of High Church principles, made his fags, two very nice well-conditioned young scholars, get up early and come to his room every morning, before school for prayers.

So prominent a feature in the constitution of English public schools as the institution of fagging, has, of course, received much criticism from educational reformers. The well-known author of the letters from *Paterfamilias* to the *Cornhill Magazine*, himself an Etonian, and one of those rare instances of a public-school man, dissatisfied with the recollections of his school-life, speaks of the practice with the greatest bitterness. 'Fagging,' say he, 'now happily almost obsolete, was also based upon the breeches pocket question. I used often to doubt, when called off from my studies, while a lower boy at Harchester, to mend my master's fire to prepare his meals, or to brush his clothes, whether a system which permitted and upheld such practices could really be beneficial to him or to me; but I never had any doubt that it was very beneficial to our tutor, inasmuch as it spared him the wages of some two or three servants, whose menial work was performed by the lower boys. Of course, the ingenuity of our masters discovered plenty of excellent arguments in support of practices so convenient to themselves; our parents used to be told that carrying coals for the upper boys, and toasting their muffins, made us helpful and docile, and took the nonsense out of bumptious lads; but such arguments would have applied just as aptly toward establishing the propriety of setting young noblemen and gentlemen to assist the scullion, or to sort out the dirty linen for the wash.' Doubtless many persons may be found to sympathize with this censure. They will tell us that much vigilance is necessary to prevent the abuse of the power of exacting casual service on the part of the senior boys, and that the rules of fagging, such as they are, give no adequate security against serious vexation and waste of a small boy's time. They say that the favorite apology, on the ground of its taking the conceit out of those who have been spoiled at home, is fallacious; that football and parsing are sufficient curatives of this evil tone of mind; and that if the necessity to render service to a senior takes the conceit out, the subsequent privilege of the early exercise of power only too rapidly pours it in again. They deny, also, the validity of one very favorite assertion of the upholders of the system, that the relation between master and fag often gives rise to pleasant intimacies between the upper and lower boys, intimacies beneficial to the latter; and they assert that the relation of master and fag has often marred what would otherwise have been a friendly recollection. The advocates of the system claim

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that the attendant evils are greatly exaggerated, and in some cases fictitious, while it is in many respects of essential service to the existence of a public school. They deny that it is upheld by the tutors from commercial considerations; since no really menial services are exacted, but only such as each boy might reasonably be expected to perform for himself, inasmuch as there are many men at the university who prepare their own breakfast, stoke their own fires, and go on their own errands. They claim also that the utmost facility exists on the part of the juniors for bringing any grievances before the proper authorities, and obtaining redress; and that the services of a fag are so light that he does not care or think about them. See the *Etonian*, a periodical published by some Eton boys, 1820, Oct. — 1821, July; and the *Triumvirate*, a similar and more recent periodical from Harrow School. But the principal argument in the defense of the system must always rest, its supporters tell us, upon the security afforded by it against bullying. In public schools, where the ages of the boys vary from 10 to 20 years, a much greater liberty is given to the boys, and much greater confidence is reposed in them, than in private schools—the idea being, that their characters can be truly formed only by unrestricted intercourse among themselves, not hampered by the constant presence of an official. This constant presence of a master is, therefore, replaced by the traditions and constitution of the school, including the fagging system, in which each boy has his assigned position, and his definite rights and duties; a constitution, therefore, which each boy feels a personal interest in upholding. Such a society necessarily requires a provision for the relation between older and younger boys, between the weaker and the stronger; for, in the absence of this, the ordinary aspects of barbarism would be presented, and brute force alone be predominant.

To those not breathing an atmosphere of ancient usage, the practice seems a lingering barbarism, and the arguments in its behalf a plea for an abuse. See PENNALISM.

FAGIN, or FAGINE, n. *fā'jīn* [L. *fagus*, a beech]: in *chem.*, the name given to a narcotic substance obtained from the nuts of the *Fagus sylvatica*, or common beech. It is a yellow mass, of a sweetish taste, easily soluble in water and alcohol, and sparingly in ether.

FAGOPYRUM: see BUCKWHEAT.

FAGOT, n. *fäg'öt* [F. *fagot*; It. *fagotto*; W. *ffagod*, a fagot — from W. *ffassgu*, to bind, to tie: comp. Gael. *fag*, to leave, that which is left]: a bundle of sticks bound together for use, as fuel, etc.; a term of opprobrium or reproach among the lower classes to children and women; an old shrivelled woman: V. to form into fagots: ADJ. nominal; fictitious, as a soldier numbered in the muster-roll, but not really existing; applied to the vote of a non resident elector — now usually restricted to a vote on a qualification created to promote party purposes. FAG'OTING, imp. FAG'OTED, pp.

FAGOTTO, n. *fa-göt'tō* [It.]: the Italian name for the

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bassoon, by which it is generally known in instrumental scores. The name is said to be derived from its resemblance to a fagot or bundle of sticks.

FAGS, n. *fäg* [etym. doubtful]: a disease in sheep.

FAGUS: see BEACH.

FAHLORE, n. *fä'lör*, or FAHLERZ, *fä'lréz* [Ger. *fahl*, ash-colored; *erz*, ore]: gray copper-ore: the type of a family of minerals containing copper; tetrahedrite, which see under TETRAHEDRON.

FAHRENHEIT, *fär'en-hīt* or *fär'en-hīt*, GABRIEL DANIEL: 1686, May 14—1736, Sep. 16; b. Dantzic: improver of the thermometer and barometer. Having travelled through Germany and England, enlarging his scientific knowledge, he settled in Holland. In 1720, he conceived the idea of using quicksilver instead of spirits of wine in thermometers, by which the accuracy of the instrument was much improved: see THERMOMETER. In 1724, F. was elected a fellow of the Royal Soc. of London; and the *Philosophical Transactions* of that year contain several papers by him.—On the F. thermometer scale, the freezing-point of water is marked 32°, and the boiling-point 212°.

FAIDHERBE, *fä-dərb'*, LOUIS LÉON CÉSAR: French general: b. Lille, 1818, June 3; d. 1889, Sep. 28. He was educated in the Polytechnic School, performed his first military service in Africa, became gov. of Senegal 1854, gen. of div. 1870; and commanded the army of the north in a number of engagements with the Prussians 1870, Dec.—1871, Jan. On 1871, Jan. 19, he was defeated by Gen. von Goeben at St. Quentin, owing to his lack of artillery and the inexperience of his army. He was a warm Gambettist, became a member of the national assembly, retired from political life on the triumph of Thiers's govt., and was appointed grand chancellor of the Legion of Honor. He published numerous scientific papers in the *Annuaire du Sénégal* (1859, 60, 61); and in the *Bulletin de la Société de Géographie*, of *Chapitre de Géographie sur le Nord-Ouest de l'Afrique* (1864); *Collection complète des Inscriptions Numidiques* (1870); and *Campagne de l'Armée du Nord* (1871). He is noted as a milit. organizer, geographer, ethnographer, and linguist.

FAIENCE, n. *fä-yängs'* [F. *faïence*—said to be from *Faenza*, in Italy, where first made]: general term for all sorts of glazed earthenware and porcelain; but applied specially to a rich painted kind. The origin of the name is disputed. Some derive it from Fayence, a small town of Provence, others from Faenza, a city of Italy; while certain writers consider that the isle of Majorca is at least the place where it was originally manufactured, in proof of which they appeal to the fact, that the Italians still call Faience *Majolica* or *Mayolina*.

FAI-FO, *fä'fō*: seaport of Anam (q.v.); one of the more considerable marts of the empire. It stands on a river near its mouth, communicating with Turon, 15 m. n. by

FAIL—FAINT.

a canal. It exports sugar and cinnamon, its principal trade being with China. Pop., mostly Buddhists, 15,000.

FAIL, *v.* *fāl* [F. *faillir*, to err, to fail—from L. *fallĕrĕ*, to deceive: W. *ffaelu*, to fail: Ger. *fehlen*, to miss: Dut. *faelen*, to slip: comp. Gael. *feall*, to deceive, to betray]: to neglect to aid or supply; to disappoint; to fall short; to become deficient; to decay or decline; not to succeed in a design; to be entirely wanting; to become weaker; to desert; to become bankrupt; in *OE.*, to deceive: N. omission; non-performance. **FAIL'ING**, *imp.*: N. a fault; a weakness; an imperfection or defect. **FAILED**, *pp.* *fāld*. **FAIL'INGLY**, *ad.* *-lī*. **FAILURE**, *n.* *fāl'ūr*, an unsuccessful attempt; deficiency; omission; total defect; decay; insolvency.—**SYN.** of 'failing, *n.*: failure; frailty; foible; infirmity; fault; deficiency; lapse; omission; non-performance; decay; defect.

FAIL, *a.* *fāl* [Gael. *fal*, a pen-fold, a hedge]: in *Scot.*, applied to a dike or wall of turf.

FAILLE, *n.* *fāl* [F.]: a soft, inexpensive silk material used for evening dresses, and for trimmings of bonnets, etc.

FAILLIS, *n.* *fāl'is* [F.]: in *her.*, a failure or fracture in an ordinary, as if it were broken, or a splinter taken from it.

FAIN, *a.* *fān* [OF. *fain*, for *faim*, hunger, vehement desire—from L. *fāmēs*, hunger: Icel. *feginn*, glad: comp. Gael. *fan*, prone]: glad to do; eager; obliged or compelled; in *OE.*, joyful; glad: **AD.** gladly. **FAINNESS**, *n.* state of being fain or desirous to do. **FAIN'ING**, *a.* in *OE.*, expressive of desire.

FAINÉANTS ROIS, *fā-nā-āng rōá* [Fr. 'Do-nothing Kings']: sarcastic designation of the later Merovingian sovereigns of France, under whose name the famous Mayors of the Palace really governed the country. The first of the F. R. was Thierry III., nominally monarch of Burgundy, Neustria, and Austrasia the others were Clovis III., Childebert III., Dagobert III.; Chilpéric II., Thierry IV., and Childéric III. The last of those was dethroned in 730, and was shut up in a monastery, and Pepin *le Bref*, Mayor of the Palace, caused himself to be formally proclaimed king. This was the end of the Merovingian dynasty; it is curious that Louis V., last of the Carolingians, descendant of Pepin *le Bref*, also received the contemptuous epithet of *Fainéant* as those monarchs had who were dethroned by his ancestors.

FAINT, *a.* *fānt* [OF. *feint*, feigned; F. *vain*—from L. *vānus*, empty, feeble: W. and Bret. *gwan*; Gael. *fann*, weak, faint]: weak; exhausted; inclined to swoon; not bright, as a color; not loud; timorous; cowardly; slight or imperfect, as a faint resemblance, a faint smell; feeble, as a faint resistance: **V.** to waste away quickly; to swoon; to be weak; to become weary; to become senseless and motionless; to sink into dejection; to lose courage; in *OE.*, to cause to faint. **FAINT'ING**, *imp.*: **ADJ.** languishing; sinking: **N.** temporary loss of motion and sensation. **FAINT'ED**,

FAINTING—FAIR.

pp. FAINT'INGLY, ad. -*li*. FAINT'ISH, a. somewhat faint. FAINT'ISHNESS, n. state of being somewhat faint. FAINTLY, ad. -*li*. FAINT'NESS, n. feebleness; want of strength. FAINT-HEARTED, a. -*hârt'éd*, yielding to fear; dejected; timorous. FAINT-HEART'EDLY, ad. -*li*. FAINT-HEART'EDNESS, n. FAINTS, n. plu. *fänts*, the impure spirit which comes over first and last in the distillation of whisky; the weak or impure remains of the whisky-still.

FAINTING, or SYN'COPE: condition in which, from a sudden mental or bodily impression, the circulation of blood is temporarily arrested or very much diminished in force and volume, the respiration and the functions of the nervous system likewise being suspended. The indications of F. to a bystander are chiefly a sudden pallor, accompanied by loss of power over the limbs, with disappearance of the pulse and movements of respiration; the eyes are commonly half open or closed, the countenance bloodless, but quite at rest, and not indicative of suffering or disturbance; the flaccid, motionless condition of all the limbs also tends to distinguish simple fainting from epilepsy, and the other diseases attended with spasm; while the vanishing of the color, and the suppression of the pulse, make a marked distinction between F. and catalepsy (q.v.), and other forms of hysteria (q.v.); with which disorders, however, F. may in some cases be associated. The mode of origin of F., and the study of its phenomena, alike lead to the conclusion that it is primarily an impression upon the nervous system, much of the same nature as the collapse, or shock of a severe bodily injury; this reacts, in the first instance, on the heart, and through the circulation on all the other functions of the body. Fainting may end in death, if too prolonged, or if associated with disease of the internal organs; especially of the heart; hence a particular variety of fainting has been separately studied, and named *Syncope anginosa*, or otherwise *Angina pectoris*: see HEART, DISEASES OF THE. Ordinarily, a person who faints from mental emotion, a hot and close atmosphere, or other transient cause, is readily restored by being laid on the back with the head low, and surrounded by abundance of cool fresh air. Any tight articles of dress should be loosened, and a stream of cold air, or a little cold water, should be directed to the face and neck, so as to rouse the respiratory movements. It is common, also, to apply ammonia or aromatic vinegar to the nostrils; but a more effective way of exciting the respiration is to compress the ribs, and allow them to expand again alternately, so as to imitate the natural movement. Care should be taken to ascertain that there is no obstruction in the throat or air-passages, as suffocation from mechanical causes has been mistaken for fainting, and the real origin of the mischief overlooked, with fatal consequences. Should all other means fail, galvanism (q.v.) will sometimes succeed in restoring the respiration and heart's action.

FAIOUM': see FAYUM.

FAIR, a. *fär* [Icel. *fagr* bright: AS. *fæger*. beautiful:

FAIR—FAIRBAIRN.

Gael. *fair*, the rising or setting of the sun]: beautiful; free from any dark hue; white; spotless; favorable; fine, as weather; prosperous; frank; civil; just; equitable; used in a slightly depreciatory sense, as a *fair copy*—that is, one not particularly good: N. the female sex; in *OE.*, for 'fairness': AD. openly. FAIR'LY, ad. justly; good in some degree; completely. FAIR'NESS, n. the quality of being fair; equity; freedom from spots or blemishes; beauty; candor; freedom from disguise. FAIR'ISH, a. *-ish*, reasonably or moderately fair. FAIR'ISHLY, ad. *-ly*. THE FAIR SEX, the female sex. A FAIR FIELD, open space for action or operation; freedom from obstructions. FAIR-FOLK, or FARE-FOLK, n. *-fōk*, the fairies: see FAIRY. FAIR-SPOKEN, bland; civil; courteous. FAIR-GRASS, n. in *bot.*, *Potentilla anserina*; *Ranunculus bulbosus*. FAIR-HAIR, n. [*Sc.*]: the tendon of the neck of cattle or sheep. FAIR-HAIRED, having light hair. FAIR-LEAD, n. in *naut.*, a term applied to ropes as suffering the least friction in a block, when they are said to lead fair. FAIR-LEADER, n. in *naut.*, thimble or cringle to guide a rope; a strip of wood with holes in it, for running rigging to lead through. FAIR-LEATHER, n. *-lēth'ēr*, leather finished in the natural color or that imparted by the tanning process; free from any special coloring. FAIRWAY, n. the navigable part of a river. TO BID FAIR, to be likely. TO KEEP FAIR, to be on good terms. TO SPEAK FAIR, to address with courtesy and frankness. FAIR PLAY, just and impartial treatment. FAIR-MAIDS OF FEBRUARY, n. in *bot.*, *Galanthus nivalis*, alluding to the blossoming of the snow-drop about February 2, or Candlemas Day. FAIR-MAIDS OF FRANCE, n. in *bot.*, *Saxifraga granulata*; *Achillea Ptarmica*; *Ranunculus aconitifolius*; *Lychnis Flos-cuculi*. FAIR-MAIDS OF KENT, n. in *bot.*, the double-flowered variety of *Ranunculus aconitifolius*. Note.—In the sense of 'equitable, just,' FAIR may be connected with Gael. *firean*, righteous, just; *fearr*, better, best—see Dr. C. Mackay.—SYN. of 'fair, a.': reasonable; moderate; middling; candid; open; ingenuous; clear; honest; direct; impartial; unblemished; handsome; cloudless; propitious; favorable; upright; pleasing; distinct; legible.

FAIR, n. *fär* [*F. foire*; *It. feria*, a market held on a holiday—from *L. feriæ*, holidays: comp. Gael. *foir*, a crowd of people; *faidhir*, a market]: a market held at stated periods (see FAIRS). FAIRING, n. *fär'ing*, a present bought at a fair.

FAIR, or BENMORE', HEAD: promontory of the n. coast of Antrim, Ireland, opposite Rathlin Isle, which is four m. to the n. west. It rises 636 ft. above the sea. The lower 300 ft. consists of carboniferous strata, overlaid by greenstone columns, 20 to 30 ft. thick, and 280 to 300 ft. high. It is perpendicular to the sea, but slopes to the land. The table-land on the top is covered with rich pasture, and presents fine views of the neighboring coast, Rathlin Isle, and the Argyleshire Highlands, 16 m. distant. On the promontory are two small lochs, 500 ft. above the sea.

FAIRBAIRN, *fär'bärn*, ANDREW MARTIN, D.D., LL.D.:

FAIRBAIRN.

Scottish Congl. theologian: 1838, Nov. 4— — — — —; b. near Edinburgh. Having studied at the Univ. of Edinburgh, he accepted a pastorate at Bathgate, Linlithgow, Scotland, and afterward went to Germany, where he continued his studies at Berlin. On his return to Scotland he preached at Aberdeen, and at the same time became a noted contributor to the press of essays on theological subjects. He was chosen principal of the Congl. college at Airedale 1878, and in the same year the Univ. of Edinburgh conferred on him the degree D.D. He was Muir lecturer on comparative religions, 1881-83. In 1883, he was chairman of the Congl. Union of England and Wales, and since 1888 he has been principal of Mansfield Coll., Oxford. He visited America in 1890, and in 1892 delivered the lectures at Yale Divinity School on the Lyman Beecher foundation. Among his published works are *Studies in the Philosophy of Religion* (1876); *Studies in the Life of Christ* (1880); *The City of God* (1882); *Christianity in the First and Nineteenth Centuries* (1883); *Religion in the History and Life of To-day* (1884); and *The Place of Christ in Modern Thought* (1893).

FAIRBAIRN, Sir WILLIAM, LL.D., Bart.: 1789-1874, Aug.; b. Kelso, in Roxburghshire, Scotland. After a little schooling he was apprenticed to an engine-wright at Percymain Colliery, North Shields; then wrought for two years in London; and then visited many places in England, Wales, and Ireland, working a short time at each, observing the various practices of different localities. Eventually, he commenced business on his own account in Manchester, 1817, without money or helpful connections. The first great improvement introduced by F. was the substitution of iron for wood in the shafting of cotton-mills, and the substitution of light for heavy shafting of metal. This economized cost, and enabled the motion to be speeded from 40 to 160 revolutions per minute. F. was among the earliest iron ship-builders, and originated various improvements in their construction, and his firm built several hundred vessels.

In 1834-5, F. was engaged in seeking the cause of defects in the iron produced by hot-blast furnaces, and in testing the strength of various kinds of iron, the tenacity of boiler-plates of various thicknesses, and the best mode of riveting.

The first idea of a tubular bridge across the Menai Strait is due to Robert Stephenson, but its realization is due to F. Stephenson's idea was a circular tube, supported by chains: but the Britannia and Conway bridges are rectangular structures, strengthened by a series of cells at the top and bottom, and without chains or any other support from pier to pier. The present form results from a long series of experiments upon model tubes—circular, egg-shaped, and rectangular. F. erected more than a thousand bridges on this principle: see TUBULAR BRIDGE. F. was created a baronet 1869. He published numerous works and papers on iron bridges, boilers, mills, etc. He was member of many scientific societies. See his *Life* by W. Pole (London 1877); and Smiles's *Lives of the Engineers*.

FAIRBANKS—FAIRCHILD.

FAIRBANKS, *fär'bänks*, ERASTUS, LL.D.: 1792, Oct. 28—1864, Nov. 20; b. Brimfield, Mass.: manufacturer. He was educated for the law, but abandoned it on account of weak eyes, and removing to St. Johnsbury, Vt., formed a partnership with his brother Thaddeus, and began manufacturing cast-iron plows 1824. In 1831 the brothers began making the celebrated scales, invented by Thaddeus F. Their works became greatly extended and they amassed wealth. Erastus was a member of the Vt. legislature 1836-38, and gov. 1852-55, 1860-61. He was a liberal promoter of religious and charitable enterprises.

FAIRBANKS, HORACE: 1820, Mar. 21—1888, Mar. 17; b. Barnett, Vt.: manufacturer. He was a son of Erastus F., and soon after his majority entered the firm of E. & T. F. & Co., of which he became pres. 1874. He was elected to the state senate 1869, but ill health prevented his serving; and was elected gov. 1876, serving one term. He built the St. Johnsbury Athenæum which with a library of 8,000 vols., and an art gallery of choice paintings, he presented to the city; joined his brother Franklin F. in building the North Congl. Church, helped found the F. Educational Board to assist students for the ministry, and was trustee of the St. Johnsbury Acad. and the Vt. University.

FAIRCHILD, *fär'child* CHARLES STEBBINS: lawyer: b. Cazenovia, N. Y., 1842, Apr. 30. He graduated at Harvard 1863, and its law school 1865; was admitted to the bar the latter year; joined the law firm of Hand, Hall, Swartz, and F.; was appointed dep. atty. gen. of N. Y. 1874; elected atty. gen. as a democrat 1876; settled in New York to practice 1880; was appointed asst. sec. of the treas. dept. 1885; and was appointed sec. of the treas. by Pres. Cleveland to succeed Daniel Manning 1887, Mar. 31.

FAIRCHILD, EDWARD HENRY: educator: b. Stockbridge, Mass., 1814: brother of James Harris F., D.D. He was educated with his two brothers and three sisters in Oberlin College; took the theol. course with his brothers; became a lecturer for the American Anti-slavery Soc. 1835; was ordained pastor of the First Congl. Church at Cleveland 1840; continued in the ministry at various places till 1852, when he was appointed principal of the preparatory dept. of Oberlin College; and after 16 years' service as principal and financial agent was elected pres. of Berea College, Ky., 1868.

FAIRCHILD.

FAIRCHILD, JAMES HARRIS, D.D.: ex-pres. of Oberlin College: b. Stockbridge, Mass., 1817, Nov. 25. He was removed by his parents to Brownhelm, O., when an infant; graduated at Oberlin College 1838, was tutor there 1838-42, ordained as a Congl. minister 1841, prof. of languages 1842-47, prof. of mathematics 1847-58, prof. of moral philosophy and theol. 1858 to the present time, and elected pres. of the college 1866. He resigned the presidency 1889. F. received his degree from Hillsdale College 1864. His publications include *Moral Philosophy* (1869, revised ed. 1892); *Oberlin, the College and the Colony, 1833-83* (1883); editions of *Memoirs of Rev. C. G. Finney* (1876), and *Finney's Systematic Theology* (1878); *Elements of Theology* (1892).

FAIRCHILD, LUCIUS: lawyer: b. Kent, O., 1831, Dec. 27. He received a public school and collegiate education; removed to Madison, Wis., 1846; made an overland ox-team journey to the Cal. gold mines 1849; returned to Madison, was elected clerk of the circuit court, and began studying law 1858; and was admitted to the bar 1860. In 1861 he served as capt. 1st Wis. vols. in the 3 months' campaign, and at its close was appointed capt. 16th U. S. inf. and maj. 2d Wis. inf.; in June he was promoted lieutenant.; and July commanded the 2d and 7th Wis. regts. in the 'iron brigade' in the first Bull Run (q.v.) battle. He served through the McClellan and Pope campaigns; took part in 14 battles and important engagements; lost his left arm while leading a charge at Seminary Hill, Gettysburg, and was promoted brig. gen. 1863, Oct. 19. In the following month he was elected sec. of state of Wis., and resigned his army commission to assume his new office 1864, Jan. 1. In 1865 he was elected gov., and was twice re-elected. In 1872 he was appointed U. S. consul at Liverpool; 1878 was transferred to Paris as consul-gen.; 1880 was appointed U. S. minister to Spain; 1881 resigned; 1882-3 was pres. of the International Exposition of Railway Appliances at Chicago; and 1886 was elected commander-in-chief of the Grand Army of the Republic. He d. 1896, May 23.

FAIRFAX.

FAIRFAX, fär'fäks, EDWARD: translator of Tasso's *Jerusalem Delivered*: natural son of Sir Thomas Fairfax of Denton, in Yorkshire; year of birth unknown, supposed to have died soon after 1631. He spent his life at Fuystone, in the forest of Knaresborough, in competence and ease, amid rural scenes, and with ample command of the means of study. His celebrated translation of Tasso was made in the reign of Queen Elizabeth, to whom it is dedicated. The first edition bears date 1600. For poetical beauty and freedom, it has had universal praise. Dryden ranked F. with Spenser as a master of English, and Waller said that he derived from him the harmony of his numbers. F. wrote also a treatise (pub. 1858-59) on *Demonology*, in which he was a believer—a credulity probably helpful in the translation of a work full of the machinery of enchantment. Hence Collins says regarding him—

Prevailing poet, whose undoubting mind
Believed the magic wonders which he sang.

FAIRFAX, JOHN CONTEE, Lord: 11th Baron F. of Cameron, in the Scotch peerage: b. Vacluse, Va., 1830, Sep. 13: physician. He was a younger son of the Hon. Albert F., received a medical education and practiced with success at Woodburne and Northampton, Md., married a daughter of Col. Edward Kirby, U.S.A., 1857, and succeeded to the title 1869, on the death of his brother Charles, 10th Lord F., formerly chief clerk of the supreme court of Cal. In 1887 he received an invitation from Queen Victoria to be present, with his fellow peers, at her jubilee in Westminster Abbey, but as he had always refused to assert his title he declined.

FAIRFAX, THOMAS, Lord: general of the parliamentary troops in England during the civil wars under Charles I.: 1612, Jan. 17—1671, Nov. 12; b. Denton, Yorkshire; son of Ferdinando, Lord Fairfax. He studied at St. John's College, Cambridge, and afterward served as volunteer in Holland, under Lord Vere, whose fourth daughter, Anne, he married soon after his return to England. On the outbreak of the civil war 1642, F. warmly espoused the cause of the parliament, and was appointed cavalry-gen. under his father, who commanded the parliamentary forces in the north. He distinguished himself by valor, prudence, and energy, and when the Earl of Essex resigned his office of gen. of the parliamentary forces, 1645, F. was appointed in his place. In a short time, Cromwell, who had been appointed lieut.gen., obtained unbounded influence over him; and from this time, though nominally head of the parliamentary forces, he really acted a secondary part. At last, 1650, June, he refused to march against the Scots, who had proclaimed Charles II. king, and Cromwell was appointed commander-in-chief in his stead. F. now withdrew into private life, and did not come forward again until after the death of Cromwell, when he showed a zeal for the restoration of the king, gathered troops for that purpose to assist General Monk against Lambert; and was appointed one of the delegates dispatched to the Hague 1660 to promote the return of Charles II. He died at Nunappleton. F. had

FAIRFAX—FAIRS.

some taste for literary pursuits, and wrote several works, prose and poetic. See his *Correspondence* (4 vols. 1848-9), and *Life* by C. R. Markham (1870).

FAIRFAX, THOMAS, Lord: 1691-1781, Dec. 12; b. England: grandson of Lord Culpepper, colonial gov. of Va.; founder in Va. of the family of F. He was educated at Oxford Univ.; wrote some time for the London *Spectator*; removed to Va. to look after the estate of 5,282,000 acres between the Potomac and Rappahannock rivers inherited from his mother, 1739; and after visiting England established himself permanently at Greenway Court, 12 m. from Winchester, 1745. Anne, daughter of his cousin, Sir William, married Lawrence, brother of George Washington, and F. becoming thus acquainted with the future gen., employed him to survey his great domain, 1748. During the revolutionary war he was a firm loyalist, yet such were his noble qualities that his property was respected both by the Americans and by the British during the struggle. He survived the mortification of Cornwallis's surrender at Yorktown only a few weeks, and after the war his property was confiscated.

FAIR HAVEN (Conn.): see **NEW HAVEN.**

FAIR HAVENS: harbor on the s. of Crete, near the port of Lasæa, ruins of which were discovered by an English yachting party 1856. The evangelist Luke is the only ancient writer who mentions it (Acts xxvii. 8). When the apostle Paul and other prisoners were being taken by ship to Italy, they sailed close to the F. H., where Paul urged the master of the ship to take refuge as he perceived that the voyage would be disastrous. The master preferred the haven of Phenice, which was more commodious to winter in, and on the way thither the Euroclydon tempest arose and wrecked the ship on the island of Melita.

FAIR ISLE: solitary isle in the Atlantic, 25 m. s.s.w. of Shetland; 4 by $2\frac{1}{2}$ m. in extent, rising 708 ft. above the sea, with high rocky cliffs and promontories. It affords copper ores, and hand-shaped sponges called 'trowie gloves.' The people are chiefly fishers. At Stromceiler Creek, was wrecked, 1588, the Duke of Medina Sidonia, admiral of the Spanish Armada. He escaped, after most of his crew were murdered. From the Spaniards who remained, the natives acquired a knowledge of the art of making woolen articles, such as caps, mittens, and stockings, in divers colors, which are still a staple for export.—Pop. (1881) 214.

FAIR OAKS, BATTLE OF: see **SEVEN PINES, BATTLE OF.**

FAIRS [see **FAIR**]: great periodical markets, some of which are devoted chiefly to one kind of merchandise, while others, of wider scope, afford opportunity for most of the sales and purchases of a district. Fairs have long been regularly held in most parts of Europe, and in many parts of Asia; but as they belong to a state of things which is passing away, they have not been established or have not acquired importance in America. In Europe, they appear

FAIRS.

to have originated in the church festivals, which afforded convenient opportunities for commercial transactions, the concourse of people being such as took place upon no other occasion. This origin of fairs is commemorated in their German name *Messen*, which is derived from the word employed to denote the most solemn part of the church service: see *MASS*. Some festivals, from circumstances of place and season, speedily acquired greater commercial importance than others, and drew buyers and sellers from remote countries. When the ordinary means of communication and of exchange of commodities were very limited, fairs were of great use. Princes and the magistrates of free cities found it to their advantage to encourage them, and granted them many privileges. Courts of summary jurisdiction—commonly called *pié poudre*, from the dusty feet of the suitors—were established distinct from the ordinary courts of the county or city, for the determination of questions which might arise during the fair. In connection with all this, the practice was necessarily adopted of publicly proclaiming the commencement and duration of the fair, and this still subsists, as in the annual fairs of some great cities of Britain, where scarcely any other vestige remains of the old privileges of fairs, and where they might with advantage to all the interests of society, be now abolished.

In w. Europe, the goods exposed for sale at fairs are chiefly those in respect of which there is frequent change of fashion. Provisions are seldom an article of merchandise in them, though in some parts of the continent persons of all ranks still wait for the great yearly fairs to make their principal purchases of manufactured articles. It is otherwise, however, in places on the outskirts of civilization; and almost all the produce of great provinces is sold, and all that their inhabitants require is bought at such fairs as those of Kiachta and Nishnij-Novgorod. The British fairs really of much use at the present day are chiefly for the sale of cattle; of these some held on the borders of the Scottish Highlands, and elsewhere in Scotland, are frequented by buyers and sellers from all parts of the kingdom, and bring together the breeders of cattle and the graziers, by whom the animals are to be fed for the butcher. Such are the fairs or trysts, as they are called, at Falkirk, Doune, Edinburgh, etc. At other great yearly fairs in the south of Scotland, lambs and wool are sold; and fairs chiefly for the sale of the annual produce of pastoral districts are common in many parts of the world.

The greatest fairs in the world are the Easter and Michaelmas fairs at Leipsic. These are not to be confounded with the Leipsic Book-fair, which is chiefly an occasion for the settlement of accounts among booksellers and publishers. Next to the Leipsic fairs, those of Frankfurt-on-the-Maine are the most important in Germany. The fairs of Frankfurt-on-the-Oder, and of Brunswick in Germany, of Zurzach in Switzerland, Pesth in Hungary, Sinigaglia and Bergamo in Italy, Beaucaire and Lyon in France, and Nijni-Novgorod (q.v.) in Russia, are among the most important in Europe. After the great fairs of

FAIRS—FAIR TRADE.

Leipsic, that called the Fair of St. Peter and St. Paul at Nijni-Novgorod is the greatest in the world, and is frequented by buyers and sellers from different parts of Europe, and of n. and central Asia. The fairs of Tanta in Upper Egypt, of Kiachta in the s. of Siberia, of Irbit, also in Siberia; of Mecca in Arabia, and of Hurdwar in w. India, also are of very great importance, and are the most considerable out of Europe. That of Kiachta is a sort of barter-market, where almost all the commercial transactions between the Russian and Chinese empires take place. The fairs in Britain have latterly in some cases degenerated into scenes of merriment, such was Bartholomew Fair, London, now extinct; also Greenwich Fair, Glasgow Fair, and Donnybrook Fair, near Dublin—this last likewise either extinct, or nearly so. The boisterous merriments at these fairs were of old the devices employed as likely to attract a great concourse of people; hence each fair had its sport or drollery—football, wrestling, yawning, cudgel-playing, throwing at cocks, sack-races, flying dragons, grinning through horse-collars, mock-giants, monstrous fishes, soaped pigs, smoking-matches, eating hot hasty-pudding, whistling, wheelbarrow races. M. Bottin, author of a statistical *View of the Fairs of France*, says that on examining his work it will appear that they were placed for the most part on the frontiers of the kingdom, or on the marches of ancient provinces; or at the foot of high mountains, at the beginning or end of the snow-season, which for months shuts up the inhabitants in their valleys; or in the neighborhood of famous cathedrals or churches frequented by flocks of pilgrims; or in the middle of rich pastures. An old fair in the n. of Scotland, in June, when the nights are very short, began at sunset, and ended an hour after sunrise: it was called 'Sleepy Market.'

FAIR TRADE: term introduced into the later discussion in England on the free-trade policy, to denote a mild modification of the protective system, based on international reciprocity, i. e., on free trade only with nations that grant similar privileges. In Britain, F. T. is sometimes also associated with projects of imperial federation; and then it included differential treatment by the mother country in favor of the Brit. colonies as against foreign nations.—See **FREE TRADE: TARIFF:** etc.

FAIRY.

FAIRY, n. *fä'rî* [OF. *faerie*, enchantment: It. *fatäre*, to charm as witches do: Sp. *hadar*, to divine: F. *féerie*, witchery—from *fée*; OF. *fae*, an elf, at fairy (see **FAY**)]: an imaginary good or bad being, said to influence the fate of men: **ADJ.** of or pert. to fairies. **FAIRY-LIKE**, like a fairy. **FAIRY-LAND**, the supposed abode of the fairies. **FAIRY-RINGS**: see below. **FAIRY-BEADS**, n. *bēdz*, in *geol.*, the small perforated and radiated joints of the fossil *Crinoidea*, found abundantly in the shales and limestones of the carboniferous or mountain limestone formation; also called St. Cuthbert's Beads. **FAIRY-GREEN**: see **FAIRY-RINGS**. **FAIRY-LINT**, n. in *bot.*, *Linum catharticum*. **FAIRY-MONEY**, n. treasure-trove; money given by the fairies was said to change after a time into withered leaves or rubbish; hence, something that becomes valueless. **FAIRY-PURSES**, n. in *bot.*, a kind of fungus. It is like a cup, or old-fashioned purse, with small objects inside; probably *Nidularia campanulata*. **FAIRY-SHRIMP**, n. in *zool.*, a species of phyllopodous crustacean, *Chirocephalus diaphanus*, occasionally found in fresh-water ponds. It is about one inch in length, and nearly transparent. **FAIRY-THIMBLES**, or **FAIRY-WEED**, n. in *bot.*, *Digitalis purpurea*. **FAIRY-STONES**, the flinty fossil sea-urchins found in the chalk of the south of England; concretionary nodules of clay found in streams and river-courses.—*Fairies*, or *Elves* were supposed supernatural beings, generally of human form but diminutive size. A belief in them has been among the superstitions of a greater portion of the European nations. The word *elf* is from Anglo-Saxon *ælf*, which corresponds to Danish *alf*, Icelandic *álfr*, and German *alp*; but the Germans adopted, in the 18th c. *elf* and *elke*, from the English for the same idea. Fairy is properly enchantment, or the realm of fairy spirits, *fay* being originally the name of the sprites themselves. *Fay* (Low Latin *fata*, fairy; French *fée*) is from Latin *fatum*, fate, and anciently meant the goddess of destiny. From the Old French *fae* (= *fée*) comes *faerie*, enchantment; whence fairy. The Celtic fees or fairies are undoubtedly relics of those *matres* and *matronæ*, which appear on Gallo-Roman inscriptions as objects of popular belief. After the transfusion of the Teutonic and southern nations, the northern elves (originally of two kinds—the light elves, or elves proper, and the dark elves, or dwarfs) became mingled with their Celtic kindred the fairies in inextricable confusion.

It is generally difficult to give any scientific definition of the nature of a superstition, because its phenomena are continually varying with the time, place, and other conditions. The fairy superstition especially defies definition, because it was the peculiarity of the creatures to whom it referred that they followed no regular law, human or divine, but obeyed the impulse of their own caprice; hence every fairy tale differs from another. Still, there are distinctions and specialities that emerge in the examination of a large number of these narratives. In the first place, the superstition belongs peculiarly to modern Europe. We find nothing like it among the idolatries of the heathen referred to in Scripture, nor does the word occur in the

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English Bible, or its equivalent in the original texts. In classical mythology, there is nothing nearer to it than the nymph of the fountain or grove among the Greeks. In the next place, it may be determined that the varieties in the superstition correspond, in some measure, with those of the physical geography of the districts in which it prevails. In those parts of the world where there are mountains, mists, dangerous morasses, cataracts, and stormy oceans, all superstitious beliefs relating to supernatural agencies, are naturally exaggerated, and, from the appalling dangers to which they relate, the belief takes deep root in the common mind. Accordingly, in flat and well cultivated countries like England, the fairy superstition is simple and homely, connecting itself with matters of domestic routine, such as the sweeping of the dwelling-house, the skimming of the milk, the preservation of the butter, and the like; while in the Scotch Highlands and Scandinavia the fairy folk are connected with storms and convulsions, betray people to their death, fly away with them into the infinite cloud-land, or lead them through endless caverns within the earth. It has been observed, as a further distinction, that the fairies of the German or Teutonic tribes are more harsh, fierce, uncomely, or deformed than those of the Celtic nations, which have a tendency rather to the ærial and the graceful. Still, there is so great an amount of common characteristic in the superstition throughout Europe, and its peculiarities have been found so much more emphatically displayed in Scandinavia than elsewhere, as to have suggested to some the view, that the superstition is a remnant of the old mythology of the northern nations, communicated by them to a greater or less extent to all the countries over which their vikings carried their ravages.

There is a further distinction—at least in Britain—between the fairies of poetic and heroic literature and those of popular belief—the former being princes and princesses of chivalry, distinguished from human beings only by their superhuman superiority in all the qualities which elicited respect in the age of chivalry; while those of popular belief are small in stature, sometimes decrepit and endowed with dispositions generally allied more to malignity than to magnanimity. It is common to all classes of them to be deemed under the condemnation of the religion of the gospel, and to be either conditionally or unconditionally excluded from the abodes of the righteous in the next world. In Ireland and the Highlands, they have been spoken of as a wandering remnant of the fallen angels. It is sometimes a symptom of geniality and kindness in a people when their fairies are supposed to be capable of earning their own redemption. Sometimes they are supposed to be human beings, metamorphosed or disembodied, and this form of the superstition has made fairyland a place of purgation for those whose sins have condemned them to it. The analogy is carried out in the belief that the services of the living can extricate the souls so situated; but it is rather through dexterity and courage than pure

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piety that the feat is achieved, and the rescues from fairy-land form some of the most wild and exciting of the elfin narratives—as, for instance, the strange, wild ballad of *Tamlane*.

There is still another broad distinction of fairies into those that dwell in the upper air and those that dwell within the bowels of the earth, while a third class frequent the waters. The surface of the earth on which mankind reside is not deemed the proper place of any class of elves except on special occasions. The Scandinavians called the fairy inhabitants of the air white elves; those of the earth, black. Whatever was genial, light, playful, and benevolent in the superstition, clustered round the former; the latter did all the work that was dark, cruel, and rapacious. Naturally enough, the black or subterranean kind frequented mining districts, where they might be seen extracting the ore for themselves, and thus unwittingly leading the miner to rich veins of metal. They might be seen in an occasional peep through an aperture of a hill in their underground retreats, in chambers supported on jasper columns, where they were stowing away their hampers of gold and silver—for they were generally held to be very affluent. Some of the most exciting tales about the German gnome, and the Irish leprechaun, a creature of the same kind, are founded on the efforts of adventurous mortals to get possession of their riches. There exists a legend, in nearly identical terms in several countries, which connects some piece of valuable plate belonging to a church with the underground fairies. The story of the horn of Oldenburg is a type of these narratives. The pictures of it represent it as a beautiful drinking vessel, in the shape of a horn, exquisitely decorated with finest fanciful silver-work, in the style contemporary with the richest Gothic architecture. The legend is, that Otho of Oldenburg, exhausted with hunting, and very thirsty, exclaimed: 'O God, would that I had a cool drink!' Thereupon there appeared before him, as if coming out of the rock, a lovely maiden, who offered him a drink in the fairy horn. He made off with it, and saved himself from evil consequences by bestowing it on the church. Hence these relics are generally in churches; but one of them is, or lately was, in the possession of an English family, and as their prosperity was traditionally believed to depend on retaining it, it was called 'The Luck of Eden Hall.'

Puck and the pixies belong to the same class of beings. Of the ell-folks of Scandinavia, the male is old and ill-favored, but the evil element in the ell-woman or ell-maid consists in her beauty, which enables her to be very dangerous to foolish young gentlemen, whom she waylays either by her own proper charms, or by personating the objects of their affections.

In Ireland, and in the border country of Scotland, the fairy superstition has been the theme of innumerable poetic legends and mystic traditions. T. Crofton Croker, in the *Fairy Legends and Traditions of the South of Ireland*, 3 vols. 1828, presents a full and amusing account of the Irish

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fairies, or elves, which he describes as 'a few inches high, airy, and almost transparent in body; so delicate in their form that a dew-drop, when they chance to dance on it, trembles indeed, but never breaks. Both sexes are of extraordinary beauty, and mortal beings cannot be compared with them.' They do not live alone, or in pairs, but always in large societies, and are governed by a queen. The same author adds: 'They are invisible to man, particularly in the day time, and as they can be present and hear what is said, the peasantry never speak of them but with caution and respect, terming them the good people, or friends. They have their dwellings in clefts of rocks, caves, and ancient tumuli. Every part within is decorated in the most splendid and magnificent manner; and the pleasing music which sometimes issues from thence in the night has delighted those who have been so fortunate as to hear it.' There are Irish fairies, however, of more special character. Among these are the Banshee, or female spirit who watches a particular family; the Cluricaune, an elf of evil disposition, who usually appears as a wrinkled old man, and has a knowledge of hidden treasure; and the Phooka, a spirit of diabolical disposition who sometimes appearing as an eagle or a black horse, hurries to destruction persons of whom he gets control. Of similar varieties are the Scottish elves: the Brownie, or domestic spirit nearly corresponding to the Banshee; the Kelpy, a kind of water-horse, being little different from the Phooka; and the Cluricaune being as regards figure somewhat analogous to the being sung by Leyden in his charming ballad, 'The Court of Keldar' (*Minstrelsy of the Scottish Border*):

'Brown dwarf, that o'er the Muirland strays,
Thy name to Keeldar tell!'
'The Brown Man of the muirs, who stays
Beneath the heather-bell.'

According to Irish as well as Scottish fairy superstition, the elves, though in the main harmless, or at most tricky, have the bad reputation of stealing away young children from the cradle and substituting for them a changeling who bears a resemblance to the stolen infant, but is an ugly little creature, and never thrives. On this theft of a female infant, who is carried to Fairyland, but in the course of years returns to her parents, James Hogg founded his fine ballad of 'Kilmeny' (*Queen's Wake*). It need hardly be added, that in the progress of general intelligence, the fairy superstition has disappeared in Scotland as well as in the greater part of Ireland, and now is as little a matter of credence as is the belief in England of that useful drudging fiend, Robin Goodfellow. Besides being embalmed in imaginative literature, the fairy has a perpetual memorial in the small exquisitely shaped arrow-heads found so abundantly in northern countries, where they were long known as elf-arrows, or bolts with which the more malignant fairies sometimes slew or injured cattle and human beings; thus, when a poor man's cow or heifer was suddenly affected with some deadly and incomprehensible illness, it was said to be 'elf-shot:' see **ELF-ARROWHEADS**.

FAIRY RINGS—FAITH.

For the most comprehensive account in the English language of the various shapes assumed by this superstition, see *The Fairy Mythology*, by Thomas Keightley.

FAIRY RINGS : spots or circles sometimes seen in pastures, which are either more bare than the rest of the field, or more green and luxuriant. Frequently a bare ring appears, like a footpath, with green grass in the centre, and the circle which the ring forms, or of which it might form a part, is often some yards in diameter. These rings began to attract the attention of men of science in the latter part of the last century, and various hypotheses were suggested to account for them. Some imagined that they might be the effect of lightning. Dr. Withering appears to have been the first to ascribe them to the growth of fungi. Dr. Wollaston further investigated the subject, which has more recently been very fully investigated by Prof. Way; and it is now ascertained and universally admitted that fairy rings result from the centrifugal development of certain kinds of fungi, especially of *Agaricus oreades*, *A. gambosus*, *A. coccineus* and *A. personatus*. The Common Mushroom (*A. campestris*) shows a tendency to grow in the same manner. Probably the spot where the agaric has already grown is unfitted for its continued nourishment, and the *mycelium* (spawn) extends outward to new soil, the fungus unfitting the soil to which it extends for the immediate nourishment of grass, but enriching it afterwards by its own decay. The *mycelium* of many fungi has certainly a tendency to extend outward from a centre; and decayed fungi, containing not a little of the phosphate of potash, are a highly stimulant manure for grasses. Fairy rings of large size sometimes occupy the same situation for many years. The circle is almost always imperfect, some accidental circumstance having arrested the growth of the *mycelium* on one side.

FAIT ACCOMPLI, n. *fāt ak-kōng-plē* [F.]: a fact already accomplished or completed; a scheme or idea already carried out.

FAITH, n. *fāth* [OF. *feid*; F. *foi*—from L. *fidem*, trust; It. *fede*, faith: comp. Gael. *feath*, calmness]: belief; trust; confidence; sincerity; belief in revealed religion; trust in God; a system of doctrines or tenets. **FAITHED**, a. *fāht*, in *OE.*, invested with credibility; believed. **FAITHFUL**, a. constant; of true fidelity; not fickle; true; exact. **FAITHFULLY**, ad. *-lī*. **FAITHFULNESS**, n. constancy; fidelity. **FAITHLESS**, a. *-lēś*, not true in the performance of duty; false; not believing. **FAITHLESSLY**, ad. *-lī*. **FAITHLESSNESS**, n. perfidy; unbelief; treachery. **FAITH BREACH**, in *OE.*, breach of fidelity; perfidy. **THE FAITH**, the Christian religion. **THE FAITHFUL**, those firm in their adherence to the truths of Christianity; applied to their co-religionists by Rom. Catholics and by Mohammedans. **DEFENDER OF THE FAITH**: see under **DEFEND**.—**SYN.** of 'faithful': trusty; honest; upright; sincere; veracious; loyal.

FAITH : term used in various senses in theology. It is taken sometimes to denote the mere assent of the under-

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standing to a set of facts or of propositions set before it; it is more properly, or more scripturally, used to express the living reception by the heart of the 'truth as it is in Christ.' Some divines have enumerated no fewer than four kinds of faith: 1. The faith of miracles, or that immediate persuasion of the Almighty presence and power of their Master, which enabled the early Christians to work miracles—a persuasion, apparently, which might exist and issue in astonishing results without being associated with moral excellence: 'Though I have all faith,' says the Apostle Paul, 'so that I could remove mountains, and have not charity, I am nothing.' 2. Historical faith, or the assent of the mere intellect to truth, the evidence of which is irresistible, such as we have described above. 3. Partial or temporary faith, such as our Lord implies in his exposition of the parable of the Sower, and as appeared to animate those who, after having followed after Christ, turned back and walked no more with him. 4. Saving faith, or the persuasion of Christian truth wrought in the heart of the Holy Spirit—the chief Scriptural sense of the term.

These distinctions are theological refinements; the proper and characteristic meaning of the term in Scripture has little to do with any of them except the last. 'Faith,' says the writer of the Epistle to the Hebrews, 'is assurance of things hoped for, a conviction of things not seen.' It is a vision, a quality, or capacity of soul for action,—manifesting itself in the soul as a 'grace' or free gift of God—whereby spiritual truth is apprehended, and spiritual life engendered. The distant is brought near by it, and substantially appropriated; the unseen is felt to be a reality. Faith is the movement by which the soul passes beyond the present and the visible to the eternal and the invisible. Still more characteristically, perhaps, faith is the living affection which binds the Christian to Christ as a *personal Savior*. 'What shall I do to be saved?' asked the Philippian jailor of Paul. 'Believe on the Lord Jesus Christ,' was the reply, 'and thou shalt be saved.' It is Christ or God—a living person—rather than any mere truth or system of truths which is represented as the proper object of Christian faith. 'Believe in God, believe also in me.' 'We believe on him that raised Jesus our Lord from the dead.' 'Abraham believed God, and it was reckoned unto him for righteousness.' 'Come unto *me* all ye that labor and are heavy laden, and I will give you rest.'

Faith, therefore, in this its highest view, is nothing but supreme trust in God and His Christ. This is the faith which 'worketh by love,' and 'overcometh the world'—the faith of which the Apostles Paul and John alike speak. The faith mentioned by the Apostle James in apparent conflict with works is different; it seems to have been a mere religious distinction as between parties of Christians—'Thou hast faith, and I have works.' One party put forth faith as their religious badge—another works. The spiritual or true meaning of either the faith or the works was little regarded. The Scriptures teach always that a faith

FAITH CURE.

that does not issue into works and control the life, is not really faith.

Faith, in the distinctively Christian sense, can exist only by the operation of God's Holy Spirit. 'For by grace have ye been saved, through faith; and that not of yourselves: it is the gift of God.' Evangelical divines greatly insist on the necessity of this operation of the Spirit of God, yet in no wise thereby excluding the active co-operation of man, but rather as indicating the deepest ground of the man's action in believing. The Pelagian and Antinomian extremes respectively throw out—the former the divine; the latter the human element. The Scriptural teaching combines the two. For some principal theological controversies connected with faith, and not above mentioned, see JUSTIFICATION.—For the Analogy of Faith, see ANALOGY.

FAITH CURE: practice involving a professed belief that the bodily maladies of Christians are to be healed by the exercise of divine power, in answer to believing prayer, and without medical or surgical aid. They who avow this belief say that the atonement of Christ has provided salvation for the body as well as the soul, and secures the possibility of deliverance in this life both from the inward power of sin and from sickness, provided that Christians comply with all the divine conditions. In support of their doctrine, appealing to the Scriptures, they say: that in Old Testament times from the patriarchs to the prophets, exemption and deliverance from physical disorders were sought, promised, and obtained through the direct agency of God; that the Savior, from the very beginning of his ministry, healed all kinds of bodily and mental diseases and infirmities, in order to fulfil the prophet's declaration, 'Himself took our infirmities and bare our sicknesses;' that, after his ascension, the apostles continued the work, exercising and imparting gifts of healing wherever they went; and that almost at the close of the New Testament the general direction is given, 'Is any among you sick, let him call for the elders of the church, and let them pray over him, anointing him with oil in the name of the Lord; and the prayer of faith shall save him that is sick, and the Lord shall raise him up.' In proof that, in fact, at the present day, complicated and violent diseases are cured in answer to prayer without the aid of medicine or physician, many cases are persistently published, some of which are—a withered hand, paralyzed limbs, and shattered nerves restored; malignant cancers and tumors cured; curvatures of the spine made straight; and diseases of the heart removed.—Those who do not accept this doctrine as accordant either with Scripture or with fact, say that equally remarkable cures are alleged to have been wrought at Lourdes, France, in answer to prayers offered to the Virgin Mary accompanied only with the use of unmedicinal spring water. Among these cases are—a half destroyed eye, a paralyzed hand, and drawn-up limbs restored; a running ulcer, and a body full of sores healed. The advocates of F. C. believe in the efficacy of prayer offered to God in the name of Christ. But they do not

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believe, probably few of them could be driven to allow, that the power of God is exerted in answer to prayer to the Virgin. If therefore the alleged cures have been wrought at her shrine they must, although inexplicable, be attributed to natural causes. Why then may not those alleged on the faith cure side also be? One advocate of F. C., however, seems ready to accept even the Lourdes cures as 'divine healing,' saying, 'If *faith in God* is exercised there, healing comes of course.' The adherents to this theory also assert that their number is rapidly increasing; that Dr. Cullis, in Boston, has crowds of sick people around him two hours daily five days in every week; that in Connecticut, a woman, having the gift of healing, is sought after continually; that there are 30 faith 'Homes' in America, and many in Europe, some of them, commodious institutions, as that at Bad Boll, near Stuttgart, which is crowded with guests seeking the healing power of God; that, in 1885 an international council on this subject was held in London, composed of delegates from all parts of the world; and that during the last three years at conventions in New York, Philadelphia, Baltimore, Pittsburgh, and other American cities, 'Divine Healing' has been earnestly discussed.—The general Christian view of F. C. is probably the following: While it is not to be denied that certain cases of disease may be healed by the prayer of faith, it must yet seem vain to expect to bind God's wisdom and power to do man's will in such cases generally. The prayer of faith is necessarily a prayer of submission to God's will, and has no healing force or other force aside from such submissiveness. Moreover true faith, so far from calling us to dispense with all known remedial means, calls us to ask God's blessing on the diligent use of them: thus, the 'anointing with oil' (the common oriental remedy) is to be 'in the Name of the Lord.'

FAITH-ENROLLE, n.: in *law*, a deed enrolled as a bargain and sale of freeholds.

FAITHFULL, *fāth'fūl*, EMILY: reformer: b. Headley rectory, Surrey, Eng., 1835–1895, June 3; dau. of Rev. Ferdinand F., of the Established Church. She was educated in a Kensington school, and after her 20th year passed some time in the enjoyment of the social life in London, till, becoming interested in the condition of women, she applied herself to extending their sphere of labor. Her first efforts culminated in a large printing establishment, in which women were employed as compositors. In 1860, Queen Victoria, who had watched her labors with interest, gave her approval to the enterprise; and when presented with the *Victoria Regia*, an elegant specimen of workmanship wholly produced in the establishment, she allowed the concern to be styled the 'Victoria Press,' and appointed Miss F. printer and publisher in ordinary to her majesty. In 1863, May, Miss F. started *The Victoria Magazine*, monthly, in which she earnestly set forth her views and the claims of women to remunerative employment. She published a social novel *Change before Change*, 1868, and soon afterward made her

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appearance as a public lecturer in advocacy of her all-engrossing ideas. She published *Three Visits to America* (London 1884), and in 1888 conducted a large publishing establishment, with book-bindery, salesroom, and stationery business combined.

FAITHORNE, *fä'thorn*, WILLIAM: eminent English engraver b. London, in the early part of the 17th c.; d. 1691, May. He was a pupil of Mr. (afterward Sir Robert) Peake, printer and printseller. On the outbreak of the civil war, he followed his master, who had taken up arms for King Charles. Both were taken prisoners at Basing-House. F. was sent to London, and imprisoned in Aldersgate, but after some time was released, and went to France, where he increased his proficiency in the art of engraving, and returning to England about 1650, began business as a printseller near Temple Bar. He also engraved steadily up the booksellers at the same time. About 1680, he gave for his shop, but still prosecuted his art, besides executing portraits in crayon, and painting in miniature. F.'s engravings are mostly portraits. Walpole has given a list of them, including portraits of 'Thomas Hobbes,' ætat 76; 'Henrietta Maria;' 'Cromwell;' 'Prince Rupert;' 'Sir Thomas Fairfax;' and 'John Milton,' ætat 62. At first F. imitated the Dutch and Flemish manner of engraving; but his residence in France appears to have modified his earlier style. F. was an author also, having published 1662 a treatise on engraving, dedicated to his old master, and entitled *The Art of Graveing and Etching, wherein is expressed the true Way of Graveing in Copper. Also the Manner and Method of that famous Callot and M. Borse in their several Ways of Etching.*

FAITOUR, *n. fä'tür* [OF. *faiteor*, a maker or constructor—from *faire*, to make—from L. *fäcĕrĕ*, to do, to make]: in *OE.*, one who makes for an ill purpose; a rascal; a traitor; a hypocrite; a scoundrel; a miscreant.

FAIX [a corruption of *faith*]: in faith; verily.

FAKE, or FAIK, *n. fäk* [Scot. *faik*, a fold, a plait]: the single coil of a rope or cable when the coils are laid on, or are close to, each other; or as in the case of slate-stones, whose leaves or layers rest upon each other, and can be easily separated; in *Scot.*, a miner's term for sandy *shales* which split up into layers: V. to coil loosely, so as to be ready for use, a line, a rope, or a cable; to fold or tuck up. FAKING imp. FAKED, pp. *fäkt*.

FAKE, *n. fäk* [Gael. *faigh*, to get, to acquire]: in *thieves' slang*, to acquire; to lay hold of; to steal. FAKE'-MENT, *n.* a begging petition. FAKER, *n. fä'kér*, one who steals anything; a pickpocket.

FAKIR, sometimes FAQUIR, *n. fä-kēr'* [Ar. a poor man]: member of an order of mendicants or penitents, chiefly in India and the neighboring countries. In Persia and Turkey, the word is used also for Moslem priests, hermits, or monks, and dervishes (see DERVISH). The origin of Fakirism, an institution which reaches to the most remote antiquity, is lost in mythical darkness. The com-

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mon account of the son of a mighty rajah, who, expelled from his home and country by the cruelty of his father, made a vow, half in revenge, half in contrition, henceforth to roam a beggar through the world, and to win proselytes to a life of poverty and self-mortification, as the one most befitting in man, and most pleasing to the Deity, cannot be called historical. The same yearning for rest, for peace, and pious contemplation, for escape from the noise and turbulence of the world, which has everywhere and always led still and pensive minds into seclusion, must naturally have been more powerful in a land which yielded almost of itself, and in abundance, all that was necessary for the sustenance of man—in a climate of flower and sunshine, where a hermit's calm retreat might easily rise before the wearied eye in the hues of Paradise. But constant seclusion and ceaseless meditation there, as elsewhere, produced sad results. Inward piety is no longer enough; sanctity established through outward observances is the goal. Thus, abstinence becomes mortification and self-torture; mental repose, mystic self-absorption, or frenzied exaltation. This leaning of the Hindus to a life of asceticism was fostered by their primeval religion, which enjoins various exercises of penance and mortification on the three higher castes in general, but upon the Brahmins in particular. These, having passed through different stages of regeneration, end by becoming Sanyassis ('who have left everything') and are dead to the law. The world and its usages have no more any claim upon them; even religious ceremonies are no longer necessary to the 'United with God.' They go naked, or in filthy rags, receive the meanest food only, and that without either demand or thanks. Their ethical code consists in the observance of truth, chastity, internal purity, constant repentance, and contemplation of Deity. After these models Fakirism seems chiefly to have been framed, and its adherents were not only pious men, but occasionally were reputed saints, workers of miracles, and healers of all ills, especially epilepsy and sterility. The halo which from the first surrounded Fakirism, and the ready homage offered by the people, attracted to its ranks, at a very early date, many whose motives were impure, and who, under a garb of humility and mendicancy, collected fabulous treasures. Strabo distinguishes these vagabonds from the more honest members of their class, and if we may trust the travellers of our own day, the more respectable element has now altogether disappeared. Their number is variously stated. In the time of Tavernier's visit, there were more than 1,200,000 Hindu, and 800,000 Mohammedan fakirs in the E. Indies, and their present number is said to exceed 3,000,000. Papi describes the Mohammedans as guilty of the greater follies. At times, especially in their return from distant pilgrimages, they are even dangerous, as the killing of an unbeliever is supposed an infallible introduction to the glories of paradise. They live either separately as hermits or solitary mendicants, or unite in large gangs, carrying arms and a banner, beating drums, and sounding horns as they approach a town or

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village. Their appearance is disgusting in the extreme; they go naked, besmeared with the dung of the holy animal, the cow. Some bedeck themselves with the skins of serpents, some with human bones; others array themselves in the garb of women. Their fearful shrieks, and the hideous rollings of their eyes, add to the disgust of their appearance. Imitating madmen, they generally end by becoming madmen. The height to which self-torture is frequently carried by these wretched fanatics and of which we meet with signs even so far back as the Ramayana, in which a penitent is described as perpetually sitting with upraised arms between four fires, the sun forming the fifth, is so appalling that human nature shrinks from the mere description. Some pass their whole lives in iron cages, laden with heavy chains; some clench their fists till their nails grow through the hand; others hold aloft both their arms till they become like withered branches; while others, again, tie their hands and feet together, and roll head over heels for thousands of miles. These antics of a horrible religion are not confined to men, but youths and even children of tender age are occasionally initiated therein.

FALABA, *fā-lā'bā*: fortified town of Senegambia, cap. of Sulimana, w. Africa; on the Fala river; 190 m. n.w. of Freetown, 215 m. n. e. of Sierra Leone. The fortifications consist of a high stockade, with a moat 20 ft. wide and deep, which surround the town. The houses are built of clay and arranged in clusters round court yards. F. was founded by the Sulimas, a tribe of the Mohammedan Foulas, who revolted and became masters of the neighboring villages and country. It was visited by Maj. Laing 1825, and Winwood Reade 1869, both of whom wrote descriptions of the town and its people.

FALAISE, *fā-lāz'*: town of France, dept. of Calvados, on a lofty platform bordering on a precipice, or *falaise*, whence its name. It is on the Anté, a feeder of the Dive, 22 m. s.s.e. of Caen. It has three suburbs, one Guibray, a mile to the e. rivals the town itself in size and population. The buildings of interest are the ecclesiastical edifices, the hospital, the public library, and, more than all, the old and ruined castle, once the seat of the dukes of Normandy, and the birthplace of William the Conqueror. In the castle, the chamber in which the Conqueror was born is still shown, as well as a tower called 'Talbot's' Tower, supposed to have been built by Talbot when lord warden of the district, after the capture of F. by Henry V. of England. F. has manufactures of cottons, hosiery, and bobbinet. At Guibray, an important annual fair is held Aug 10-25, at which great numbers of horses and cattle are sold. Pop. (1881) 8,201; (1891) 8,313.

FALASHAS, *fā-lā'shas*: body of Jews occupying the high regions of Samén and the plains along Lake Tzana, Abyssinia. Their origin is uncertain, though many authorities believe they are not natives of the locality, from their name, which means exiles or wanderers. According to their

FALCADE—FALCIDIAN LAW.

own traditions, however, they are descendants of the tribe of Levi and settled in Abyssinia in the days of King Solomon. They inhabit principally the provinces of Samen, Wogara, Armatshoho, Walkait, Tchelga, Dembea, Tenkel, Dagusa, Alafa, Kunsula, Aschafer, Agarv-Meder, and Quara; observe the Jewish modes of life; and differ from other Jews in personal appearance and the belief that commercial transactions are virtually forbidden in the Mosaic law. They have no knowledge of either the Babylonian or Jerusalem Talmud, do not use the *tephilin* nor observe the feast of Purim nor the dedication of the temple, and are ignorant of Hebrew; but possess in Ethiopic a variety of religious rules and instructions such as the canonical and apocryphal books of the Old Test., a vol. of extracts from the Pentateuch with God's comments to Moses on Mount Sinai, laws governing the Sabbath, lives of the prophets, and a translation of the writings of Josephus. They observe with extreme rigor the Sabbath, which has been deified and as the goddess *Sanbat* receives both adoration and sacrifice. They are so afraid of giving offense that they will not dress themselves on that day. A limited superstition prevails among them, the *Ardit*, a book of secrets revealed to 12 saints, being used as a charm against disease. They are handsomely formed, of medium height, with oval faces and long curly hair. While religiously averse to engaging in commerce, they are exceedingly industrious, cultivate the soil, manufacture pottery, iron ware, and cloth, and have great skill as architects and masons. They are exempt from military duty on account of their scruples against shedding human blood, though during the war between Great Britain and Abyssinia 1868, many of them distinguished themselves as warriors under King Theodore. The F. were independent and governed by their own princes till the beginning of the 19th c., when they were conquered by the Amharas, and have since been under the rule of the princes of Tigré. They number abt. 250,000.

FALCADE, n. *fäl-käd'* [F.—from L. *falx*, a sickle, a hook]: a falling sharply on the haunches, as a horse.

FALCARIOUS, a. *fäl-kär'î-üs* [L. *falcarius*—from *falx*, a scythe, a sickle]: in bot., plane and curved with the edges parallel.

FALCATE, a. *fäl'kät*, or FAL'CATED [L. *falcatus*, scythe-shaped—from *falx*, a reaping-hook: It. *falcato*]: in bot., bent or shaped like a reaping-hook; crescent-shaped.

FALCA'TION, n. *-kä'shün*, the state of being crooked as a sickle; a bending in the form of a sickle. FALCIFORM, a. *fäl'si-fawrm* [L. *forma*, shape]: shaped like a reaping-hook.

FALCHION, n. *fawl'shün* [It. *falcione*, a scimitar—from mid. L. *falcionem*, a sickle-shaped sword—from L. *falcem*, a reaping-hook: F. *fauchon*, a small scythe: comp. Gael. *fal*, a scythe, a spade]: a short crooked sword; a scimeter: see SWORD.

FALCIDIAN LAW, *fäl-sid'î-an*: statute proposed by the Roman tribune Falcidius, and enacted during the reign of

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Augustus in the year of Rome 714. It gave power to fathers of families to bequeath three-fourths of their property by will as they pleased, but prohibited their giving away the other fourth, termed the Falcidian portion, which was to descend to the heir. The same principle prevailed in England in early times, and is still observed in several states of the American Union. At common law no such testamentary restrictions exist.

FALCK LAWS (against Papal claims): see GERMANY.

FALCON, n. *faw'kn* [F. *faucon*; OF. *faulcon*—from mid. L. *falcōnem*; It. *falcone*, a falcon—from L. *falx*, a reaping hook]: a hawk trained for hunting—so named from its hooked beak. FALCONER, n. *faw'kn-ēr*, one who trains or sports with falcons. FALCONRY, n. *faw'kn-rī*, the art of training or hunting with hawks. *Falcon* in the Linnæan zoology, genus of birds, including all the diurnal birds of prey, now known as the family of *Falconidæ* (q.v.); but in its present use as a generic name, limited to nearer accordance with its popular use, as a designation of those species which, in the language of falconry, were styled *noble birds of prey*. The true falcons are characterized by a bill curved from the base, the upper mandible hooked at the point, and the cutting edge of the upper mandible furnished with a strong projecting notch, or *tooth*. The claws are sharp, curved, and strong; and in accordance with all this powerful armature, the whole frame is very robust and muscular. The legs are rather short, and have great power in striking or seizing prey. The keel of the sternum (breastbone) is very large, and adapted for the attachment of powerful muscles; the furcula and coracoid bones (see BIRDS) also are very strong, to afford a sufficient resisting base for very powerful action of the wings. The wings are long and pointed, the first and third quill-feathers of equal length, the second rather the longest, the first and second quill-feathers emarginated near the tip. The true falcons are bolder in proportion to their size than any other *Falconidæ*—even eagles. Their acuteness of vision is wonderful; and they have very great powers of flight. A F. is known to have traversed the distance between Fontainebleau and Malta, not less than 1,350 m. in 24 hours. The speed attained by a F. in pursuit of its prey has been calculated to be at the rate of 150 m. an hour. They soar to a prodigious height in the air, always endeavoring to outsoar any bird of which they may be in pursuit, and to swoop down upon it from above; though it is far more difficult for them to rise vertically in a calm atmosphere than for birds of short and rounded wing, and they either rise obliquely—often also making their onward flight in a series of arcs—or avail themselves of the wind, and by flying against it, are borne aloft as a boy's kite is. The species are numerous; some are of very wide geographic distribution, while others are peculiar to certain countries or climates. Among the species are the GYRFALCON (q.v.), or Jerfalcon (*F. Gyrfalco*); the Iceland Falcon (*F. Islandicus*); the Greenland Falcon (*F. Grenlandicus*); the PEREGRINE F. (q.v.) (*F. peregrinus*),

FALCON—FALCONER.

of which the female is *par excellence* the F. of Falconers (see FALCONRY), and the male is the Tercel, Tiercel, or Tercelet; the HOBBY (q.v.), (*F. subbuteo*); the Red-footed F., or Red-legged F. (*F. rustipes*), a small species, much resembling the Hobby; the MERLIN (q.v.), (*F. æsalon*); and the KESTREL (q.v.), or Windhover (*F. tinnunculus*). For the species chiefly used in falconry, see FALCONRY.

The first 3 mentioned, and the Labrador F. (all native in N. Amer.), are thought to be possible varieties of one species. These (all very large, with tarsus narrowly bare behind), the Peregrine, and the Lanner or Prairie F. (*F. mexicanus*), grayish brown above (a w. species), and the Pigeon and Sparrow Hawks, represent the genus *Falco* in N. America.

FALCON, *fâl-kôn'* (formerly Coro): irregular-shaped province of Venezuela, S. Amer.; bounded n. and e. by the Caribbean Sea, s. by the provinces of Carabobo and Barquesimeto, w. by the province of Maracaybo; 11,250 sq. m. Its surface is diversified, though chiefly a low plain; the Sierra de Coro attains an elevation of 4,250 ft. in the interior; and while the soil in general is neither fertile nor adequately watered, the highest parts of the mountains are covered with fine forests. Products: cattle, coffee, cacao, cotton. Cap. Coro. Pop. (1873) 99,920; (1886) 198,260.

CORO, or SANTA ANA DE CORO, town, cap. of the province of Falcon, is near the Caribbean Sea and the isthmus connecting Paraguana with the mainland. Pop. (1887) 8,881.

FALCONE, *fâl-kô'nâ*, ANCILLO: 1600-63; b. Naples: Italian battle-painter. A fellow-student of Salvator Rosa's at Spagnoletto's studio, he himself subsequently became the founder of an academy of much resort. In accordance with his turbulent impulsive nature, he flung himself into the political struggles of the times, and during Masaniello's outbreak, organized his numerous scholars and dependants into a secret band, which inflicted deadly retaliation on the Spaniards. On the suppression of the insurrection, F. fled to France, but returned to Naples, where he died. His works are few and costly; they are prized for extreme fidelity to nature, as much as for harmony and brilliancy of color, and variety of expression.

FALCONER, *fawk'nér*, or *faw'kên-ér*, WILLIAM: 1732-69; b. Edinburgh; one of a family of whom all, excepting himself, were deaf-mutes. He went early to sea, serving his apprenticeship on board a merchantman; and before he was 18 years of age he was second mate, in a vessel in the Levant trade, which was shipwrecked off Cape Colonna, himself and two others being the only ones of the crew saved. He published *The Shipwreck* 1762, and during the next year entered the navy as midshipman in the *Royal George*. When peace came, he resided in London, where he wrote a satire on Wilkes, and compiled a *Nautical Dictionary*. He sailed 1769, Sep., as purser in the *Aurora* frigate; reached the Cape of Good Hope in Dec.; and perished with his companions—the *Aurora* having gone down—in the Mozambique Channel. F. wrote several poems,

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but *The Shipwreck* is the one on which his fame rests. It abounds in nautical language, and has the rare merit of being interesting. It is not a great poem, but has always had readers and admirers. In the second ed., the author added the characters of Albert, Rodmond, Palemon, and Anna—characters bearing the same relation to actual sailors that Alexis and Chloe bear to actual shepherds and shepherdesses—and to some extent destroyed that singleness of impression which was the chief merit of his work.

FALCONET, n. *fāl'ko-nēt* [*F. falconette*, dim. of OF. *falcon*]: in *zool.*, a little falcon; name applied to a genus of tiny falcons, belonging to the sub-family *Falconinæ*, peculiar to the region of India, none being seven inches in length.

FALCONET: name in the 15th and 16th c. for the smallest class of cannon. The ball weighed from 1 lb. to 3 lbs., and the gun from 5 cwt. to 15 cwt.

FALCONIDÆ, *fāl-kōn'ī-dē*: family of diurnal birds of prey (see ACCIPITRES), corresponding with the Linnæan genus *Falco*, and exhibiting those characters of muscular vigor, armature of beak and talons, and power of flight, found in their highest perfection in the true Falcons (q.v.), and in scarcely inferior degree in the Eagles (q.v.). The species are numerous; the British Museum alone contains specimens of almost 200 unquestionably distinct species; but very many supposed species have been named and described by ornithologists, which have been ascertained to owe their distinctive characters merely to age and sex. The female is generally larger than the male; and the plumage



Head and Foot of Brazilian Eagle.

of the young different from that of the adult. There are, in the different groups, considerable diversities in the curvature and strength of the bill, which has the cutting edges of the mandibles either notched, festooned, or plain; the legs and toes also exhibit diversities as to length, strength, feathering, etc.; and in some groups, the wings are much

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longer and more pointed, than in others. This is so particularly with the true falcons, as contrasted with eagles, hawks, buzzards, kites, harriers, etc., and, in the language of falconry, the former—having the second quill-feather longest, and the first nearly equal to it—are called *noble birds of prey* (see FALCONRY), being those usually domesticated and trained for the service of man; the latter—having the fourth quill-feather longest, and the first very short—are called *ignoble birds of prey*, even eagles receiving this designation. The F. are distributed over all parts of the world; and almost all kinds of vertebrate animals, except the largest quadrupeds, are the prey of some of them. Some also devour insects. Like the *Felidæ* among ravenous quadrupeds, the F. do not willingly feed on carrion, but generally seize and kill their prey. As in the *Felidæ*, also, there is a provision for the preservation of the claws from being blunted by unnecessary contact with the ground or with any hard substance, the F. contracting the toes so as to elevate their claws. The F. generally live in pairs.

The Amer. sub-families of F. are the *Circinæ*, harriers, face with an owl-like ruff—our species being the Marsh Hawk; *Milvinæ*, kites, bill weak, tail forked or else much shorter than the long, pointed wings—examples, Everglade Kite, Mississippi Kite (s. and n. in the great valley), Black-shouldered or White-tailed Kite and Swallow-tailed Kite (same range); *Accipitrinæ*, hawks, long tail and legs, bill high at base, strong, toothless—examples, Sharp-shinned Hawk, Cooper's or Chicken Hawk, and American Goshawk, sometimes called the Blue Hen Hawk and the young called Chicken Hawk; *Falconinæ*, falcons, both mandibles toothed, the end of the lower truncated—for examples, see FALCON; *Polyborinæ*, caracaras, terrestrial in habit, feeding much on carrion—one example, the Common Caracara of Florida to Lower California; *Buteoninæ*, buzzards and eagles, cutting edge of bill only lobed or festooned—embracing the Harris's, the White-tailed, the Cooper's, the Harlan's (Black Warrior), five Red-tailed, two Red-shouldered or Winter (sometimes called Chicken Hawk), the Band-tailed, the Swainson's or Common, the Broad-winged, Rough-legged, Fuliginous, Ferruginous, Star, Gray Star, two Anthracite, the Clawed, and Gruber's Buzzards, and four Eagles; here mentioning only American species. The Fish Hawk or Osprey, probably the one and only cosmopolitan species, stands for a separate family, *Pandionidæ*; it visibly differs in close, firm plumage and immensely strong feet, both adapted to its fishing habit.

The Lammergeir (q.v.) connects this family with the Vultures; the Secretary (q.v.), while in many respects agreeing with the F., is peculiar in some of its characters. The American vultures are very different from those mentioned, and are made a sub-order, *Cathartides*; they resemble turkeys in appearance, e.g., the turkey-buzzard; the only resemblance to the old-world vultures is in carrion-feeding; the confusion of names is unfortunate. True vultures may be regarded as a sub-family of F.

FALCONRY.

FALCONRY, *faʊ'kn-rī*: the term applied to the art of training certain of the falcon tribes to the pursuit and capture, on the wing, of birds such as the heron, partridge, lark, rood, magpie, wild-duck, pigeon, etc. In ancient times, this sport was called *HAWKING*, a term still preserved in many places, and, perhaps, more strictly correct. In present usage, *Falconry* is the term applied to the sport and all that pertains to it; *Hawking* to its actual practice in the field. F. is of very ancient origin, and has been traced back, as an Eastern sport, to a period anterior to the Christian era. In Britain it seems to have been followed before the time of the Heptarchy; and in the celebrated Bayeux tapestry, Harold is figured with a hawk upon his hand. It seems, however, to have been practiced in Eastern countries, and in central Europe, long before it became established in Great Britain; and to such a height did the sport reach in Germany, that nobles, and even kings, seem to have devoted to it the greater part of their time. As an instance of this, Emperor Frederick II. of Germany was a passionate admirer of the sport, and is said to have written a treatise on F., published by J. G. Schneider, 1788 (2 vols. Leip.). In England, after the Norman Conquest, F. seems to have rapidly advanced, being much indulged in by kings, nobles, and ladies; and in those days the rank of the individual was indicated by the particular species of hawk carried on his wrist. Thus, an earl carried a Peregrine Falcon. In the 17th c., the sport declined; in the 18th c. it partially revived, but again fell off about 1725, when the art of shooting birds on the wing came into fashion. In the present day, an attempt is being made in several quarters in England, with some success, to restore this sport. In India, Persia, and other Eastern countries, F. is still eagerly practiced, the methods there followed being nearly similar to those of Great Britain.

In F., two distinct kind of hawks are used—the long-winged or true falcons, and short-winged. The first (noble birds of prey) are represented by the Gyr Falcon and Peregrine; the second by the Goshawk and Sparrow-hawk; and though for certain purposes the male is superior, as a rule the *females* of each species are much more highly esteemed for sporting purposes, from their being larger and more powerful. 'Long-winged' hawks may also, as a rule, be distinguished from the 'short-winged,' by their having a 'tooth' or notch on the upper mandible; from the second feather of the wing being either longer, or as long, as the third; and from their impetuous 'stoop' at their prey.

The Gyr Falcon (q.v.) is the largest species, but from its extreme rarity in the British Islands, is seldom used. The Peregrine Falcon is the bird in greatest favor with falconers, and if taken from the nest, as is usually the case, and carefully trained, affords better sport than any other British species. The remarks which follow refer to the sport as practiced with this bird.—No hawk is fit for sporting purposes until it has undergone a careful process of training. The young hawk is more easily trained than one grown, caught in a wild state; but in either case, a number

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of operations require to be gone through before the sportsman ventures to take his falcon into the field. Taken from her nest on some high and dangerous cliff when nearly fledged, the *eyess*, or young falcon (with her companion-fledglings, usually two in number), is carefully conveyed to the falconer's home; there she is kept in an open shed in a nest of straw, and fed several times a day on fresh beef, with an occasional change to birds or rabbits. At this somewhat critical period, she should never be handled, except to put on the *jesses* and *bells* (see fig. 1), which afterward become permanent fixtures. Her powers of flight, too, being as yet very limited, she depends upon her master for regular supplies of food, and soon learns to come for her meals at his call. Her meat is usually fixed to an apparatus



Fig. 1.—Leg and Foot of Hawk, showing the method of attaching the Bells and Jesses.

a, the end of leash; *b, b*, the jesses; *c*, the bell; *d*, the bewit; *e*, the varvels of silver, with owner's name and address engraved.

termed the *lure* (see fig. 2), and thus the hawk is early accustomed to that important instrument, the further uses of



Fig. 2.—The Lure.

which are explained below. By degrees her powers of flight are strengthened, and she is permitted to fly at large (returning to the lure at her master's will to be fed, or in hawking language, to remain *at hack*) for several weeks, during which time her meals are gradually reduced to one a day. While at *hack*, she sometimes becomes wild, wanders far from home, and kills game for herself; and when this is the case, she is usually caught by enticing her to a bow-net, close to which a pigeon or some meat is fastened to the ground.

After being 'taken up' from *hack*, she is kept at the *block* (see fig. 3)—the stand upon which she sits—for a few days before her regular training begins. At this time, also, hawks require a bath twice or thrice a week.

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The first of the principal operations in training is *hooding*, an operation which, if successfully performed by the trainer during his earlier efforts, prepares the way for overcoming many subsequent difficulties. It demands the greatest patience and the tenderest manipulation. The hood is a cap of leather (see fig. 3), made to fit the head of the falcon in such a manner as totally to obscure the light, a simple aperture only being left, through which the beak protrudes, and a slit behind, through which are passed the



Fig. 3.—Hooded Peregrine Falcon on its block:

One end of the leash is attached to the Jesses, the other to a ring driven into the side of the block; and thus the hawk is prevented from escaping.

braces or ties that secure the hood to the head. By shutting out the light, the hood is serviceable in tending to make the hawk quiet and tractable, but to accustom the falcon to submit to its use requires much time and great management. When, after great perseverance, this is achieved, the hawk is said to be '*made to the hood*,' during which process she also learns to sit balanced upon the fist. Besides tending to induce docility by hiding the light, the hood is of further service in shutting out from view any

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object which might cause the hawk to flutter or *bait* off the fist or *cadge* on its way to and from the field, etc. Hence the hawk is carried always hooded—the short-winged only being exempt. To the falcon's legs are attached two small hollow globes of thin metal, called *bells*; these are fixed to their place by leather straps called *bewits*; and both, together with the jesses, become permanent fixtures even during the bird's flights. *Jesses* are two leathern traps, five or six inches in length, attached to each leg immediately below the bells; the jesses, again, are themselves attached to another leathern strap, called the *leash*, about four times the thickness of a boot-lace (see fig. 1), by two rings or *varvels*; and the bird being thus caparisoned, the falconer winds the leash through his fingers, and so prevents the falcon's escape while on his wrist. Instead of *varvels*, some falconers follow the Dutch plan of using a swivel; the former method, however, is now considered best. A long cord, called the *creance*, is further attached to the leash, and is used for the purpose of giving the bird greater freedom during her training than that afforded by the leash alone.

The *lure* is a bunch of feathers attached to a cord and tassel, and in the centre of the feathers is usually a piece of spliced wood, to which a piece of meat may be attached. By accustoming the hawk to feed off the lure, or to come to it at a certain call or whistle to be fed when on the wing, the lure becomes an important adjunct to the falconer's apparatus, as by it he is enabled to entice his bird back after an unsuccessful chase. On such occasions, the falconer reclaims his bird by swinging the baited lure round and round his head, accompanying the action by some well-known call. Four wings tied together make a good lure. The *tabur stycke* and *drawer* were formerly used for the same purpose as the lure, but were made in the form of a stick.



Fig. 4.—
Tabur
Stycke.

In Europe, hawks are carried on the left wrist (in the East they sit on the right); and to protect the falconer's hand from being injured by the bird's claws, a glove of stout buckskin leather is used. And here it may be remarked, that the claws and beak of wild caught or *haggard* falcons, are usually pared or *coped*. If the bird to be trained, instead of being a nestling, happens to be a wild one, the difficulties of training are immeasurably increased, and can be overcome only by days and nights of unwearying exertion. If it proves unusually restless and difficult to tame, it is kept on low diet, is prevented from sleeping for several days and nights, and has cold water poured upon it by means of a sponge, etc. By these and other means, the falcon gradually loses much of its restiveness, and submits to the processes of training.

For training the *eyess*, or young falcon, to the lure, as preparatory to entering at game, Sir John Sebright says.

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'Take the hawk out while very hungry, and let an assistant swing the lure round his head steadily, and at full length of the cord; upon this the falconer casts off his hawk with the usual whistle or halloo, still holding the *creance*, and the assistant suffers the lure to fall to the ground, for fear of injury to the hawk, by striking it in the air with the two strings attached. When this lesson is perfect, the assistant, instead of suffering the lure to fall, withdraws it, and disappoints the hawk, which flies by him, and then returns, when he may be suffered to strike the lure and feed upon it. In process of time, the *creance* may be removed, and the hawk enticed to the lure from a considerable distance, and may then strike it in the air (if the lure is a light one), while swinging round the head of the assistant. After a still greater time, the hawk becomes so perfect that she will circle round the head of the falconer, waiting for the lure to be thrown, and is then said to '*wait on*' perfectly. When the hawk is feeding on the lure, the falconer should encourage her, and suffer her to finish without alarm, by which she will be shown that she may do so without fear, and will readily suffer herself to be taken after flying. She should also be accustomed to horses, men, and dogs.'

Having 'made the hawk' to the *fist*, the *hood*, and the *lure*, she is next 'entered' at her game (the *quarry*). This is done by tying a long cord or *creance* to the varvels of the jesses, and flying the hawk from the hand at a bird thrown out to it, also restrained by a cord. The hawk is next flown several times without a *creance* at birds *shortened in their flight*, after which it is ready to be entered at wild quarry. In case of failure, however, a live bird, similar to that at which she is flown, should be carried to the field, and thrown out to her in a *creance* by way of encouragement.

The heron is, and always has been, a favorite object of pursuit in British F., the period of the year best adapted for the sport being the breeding season. Having previously ascertained the feeding-place of that bird, the hawking party goes to the spot, usually toward evening, if possible in a direction *down-wind* from the heronry, so as to intercept the bird in its *up-wind* flight homeward. When a heron is seen to pass, a couple (a cast) of hawks are unhooded and 'cast off,' and the chase commences. The heron, seeing the falcons approach, disgorges its food, to lighten itself, and immediately ascends in the air; the hawks, eager in pursuit, and quicker of wing, speedily make upon it, and strive to gain a greater elevation by a series of beautiful gyrations. When one of the hawks succeeds in rising above the heron, it *stoops*, that is, descends swiftly, and in a direct line, upon the game, aiming a stroke with its outstretched legs and talons at its body; this the heron almost always succeeds at first in eluding, by a rapid and sudden movement aside. The second hawk, which also by this time has soared, then stoops, while the first is regaining its former altitude; and so on for many successive times, till one hawk at length clutches the heron or *binds*, upon which her companion

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joins her, and the three, buoyant by the motion of their wings, descend gently to the earth. The falconer's imperative duty is now to be up or near the spot where the three birds are descending, to divert the attention of the hawks before they reach the ground, and entice them from the quarry to him, by means of live pigeons as lures. This is very necessary, as the heron is extremely dangerous, and has been frequently known to injure the hawks with its sharp beak when on the ground, though it is almost harmless in the air. When the heron's wounds have been dressed—for this bird is rarely killed in such encounters—a ring with the captor's name is usually affixed to its leg, after which it is set at liberty, and so becomes available for future sport. The falconer's usual cry of encouragement to his hawks upon the springing of the quarry is 'Hoo-ha-ha-ha!' His cry when the quarry is killed, is 'Whoop!' A falcon takes its prey either by tearing or *raking* it with the *hind* claw of each foot at the instant of passing, or by clutching the victim with its talons, and when she thus succeeds in binding to her quarry, she slowly descends with it to the ground. The supposition that the hawk strikes its quarry with the beak or breastbone in its swoop, is a mistake.

Besides the Peregrine Falcon, the Merlin is trained for F., and is extremely bold. This bird, however, is flown at small game, chiefly larks. The Goshawk, though it does not soar and stoop; flies direct at its game: it is used chiefly for pheasants, rabbits, hares, etc., in an inclosed country. The Sparrow-hawk, from its extreme boldness, is a great favorite, but is flown at smaller birds only, such as black-birds, thrushes, etc. The Hobby is seldom or never used.

The following are the principal terms in falconry. A falcon's legs, from the thigh to the foot, are termed *arms*; toes, *petty singles*; claws, *pounces*; wings, *sails*; trail, *train*; crop, *gorge*; lower stomach, *pannel*; feathers, hair, etc., ejected at the mouth, *the castings*. A young hawk from the nest is an *eyess* or *eyas*; one that can hop, but not fly well, a *brancher*; a nestling hawk reared at liberty is a *hack-hawk*; a young hawk able to take game, a *soar-hawk*; a mature wild hawk is a *haggard* or *blue-hawk*; young hawks taken in their migrations, are *passage-hawks*, or *red hawks*—the term *red* being applied merely as a title of distinction between the young hawk and the eyess or nestling, the colors of the two being in reality the same. The training of the passage-hawk and haggard is termed *reclaiming*; fluttering, is *baiting*; fighting with each other, *crabbing*; sleeping, *jouking*. The prey is termed the *quarry*. When the hawk strikes her quarry in the air and clings to it, she *binds*; when she flies off with it, she *carries*; when she plucks it, she *deplumes*. Dead game is the *pelt*. *Stooping* or *swooping* is the act of descending with closed wings from a height at prey. Direct flight, without soaring, is *raking off*; changing from one bird to another, *checking*. When game flies into a cover, it *puts in*. When the hawk is moulting her feathers, she is *mewing*; after her first moult, she is *intermewed*; with complete plumage, *summed*; when

FALCULA—FALDSTOOL.

in good condition, she is *enseamed*; when out of condition, *seamed*. Mending the feathers artificially (an operation frequently performed when one has been accidentally broken) is termed *imping*; blunting bill and talons, *coping*. When the falcon is obediently flying round in the air, she *waits on her master*; flying long-winged hawks from the wrist, is termed *flying out of the hood*; a couple of hawks is a *cast*. The *cadge* is a frame of wood with four legs. It is carried by means of straps, which pass over the bearers. (the *cadgers*') shoulders, and is used, when there are several casts of hawks, to be taken to the field. The *block* (see fig. 3) is a round piece of wood, such as would be made by sawing a foot of wood out of a felled larch-tree of 20 years' growth; and upon this the hawk sits when out of doors. Through the bottom of the block runs an iron spike, which being driven into the ground, secures the block to its place and so prevents the hawk from dragging it away. Falcons are very pugnacious, and if not carefully kept separate, would soon kill each other. The *screen* or *perch* is a perch guarded by a falling piece of canvas, to support the hawks in case of their leaping down; upon this, the hawks are placed at night in an apartment called the *news*.

The best works on the subject are those of Turberville and Latham, respectively, as old treatises; and that of Sir John Sebright, as comparatively modern. Of the more recent treatises, *Falconry in the British Isles*, by Salvin and Brodrick; and *Falconry, its Claims and Practice*, by Freeman and Salvin, are standard. See also Stonehenge's *British Rural Sports* (Lond., Warne & Co.).

The village of Falconswaerd, near Bois-le-Duc, in Holland, has for many years furnished falconers to almost all Europe. Sir John Sebright says: 'I have known many falconers in England, and in the service of different princes on the continent, but I never met with one of them who was not a native of Falconswaerd.'

FALCULA, n. *fäl'kü-la* [L. dim. of *falx*, a sickle, a scythe]: in *zool.*, term applied to a claw, which is compressed, elongated, curved, and sharp-pointed.

FALDAGE, n. *farold'ij* [Low L.—from *falda*, a fold]: in *feudal law*, privilege which anciently several lords reserved to themselves of setting up folds for sheep, in any fields within their manors. FALD-FEE, n. *fē*, in *feudal law*, a composition or fee formerly paid by tenants for the privilege of faldage.

FALDERALS, n. plu. *fäl'dér-äls* [Sp. *faldilla*, a little fold or skirt; *falderilla*, a little lap]: the small pieces made to ornament a female's dress, especially when loose and in excess; gewgaws; idle fancies or conceits.

FALDSTOOL, n. *farold'stöl* [OF. *faudesteuil*—from mid. L. *fauldstitium* and *faldistörüm*—from O.H.G. *faldan*, to fold; *stual*, a stool: AS. *fald*, a fold, and *stool*]: the low desk at which the Litany is said in churches; the chair of a bishop within the rails of the altar. FALD'ISTORY, n. *-is-tér-ī*, a kind of stool on which the king may kneel at his coronation at the south side of the altar; a folding-chair.

FALEME—FALIERI.

FALEME, *fā-lū'mā*: one of the most important tributaries of the Senegal (q.v.), into which it falls, lat. about 14° 40' n., and long. 11° 48' w. Its course has not been fully explored.

FALERII, *fā-lē'rī-i*: city of ancient Etruria, w. of the Tiber, n. of Mount Soracte. Its earliest historical appearance is B.C. 437, when, according to Livy, the inhabitants (called Falisci) joined with those of Veii in assisting the Fidenates against the Romans. The Falisci were among the most dangerous enemies of Rome, and were the last of the Etrurians who submitted to its power. Their city was at last destroyed by the Romans (B.C. 241), and they themselves were compelled to choose a new site a few miles off. Here a Roman colony was settled in the time of the triumvirs, whence the place took the name of *Colonia Junonia Fulscorum*. But this Roman F. does not appear to have ever acquired any importance, for the temple which anciently attracted so many pilgrims, stood on the site of the older town. During the middle ages, however, a new city sprang up on the ruins of the Etruscan F., which finally obtained the name of *Civita Castellana* (q.v.). Ruins of the Roman or later F., consisting of a part of the ancient walls, are still visible.

FALERNIAN, a. *fā-lēr'nī-ăn* [*L. Falernus* (*Falernus Ager*), an ancient district of Italy in the n. of Campania, between the Massican Hills and the n. bank of the Volturnus; famous for wine]: of or from Falernus; applied to a wine favorite among the Romans. It is described by Horace as, in his time, surpassing all other wines then in repute. In the time of Pliny, however, Falernian wine had begun to decline in quality, through lack of care in cultivation.

FALIERI, *fā-lē-ā'rē*, **MARINO**: abt. 1284-1355, April 17: celebrated Venetian. He was elected 1354, at the age of 70, Doge of Venice, the third of his name called to this supreme dignity. At the siege of Zara, 1346, he defeated an army of 80,000 Hungarians, vigorously carrying on at the same time extensive siege-operations; and in the course of the war, having assumed command of the fleet, captured Capo d'Istria. Subsequently, he became ambassador of the Republic to Rome and Genoa. Of an ungovernable and implacable temper, his bitter resentment seems to have been roused by a grossly offensive libel on his fair and youthful wife, the author of which, a young patrician named Michele Steno, owed some grudge to the doge. The punishment awarded to the young noble by a patrician tribunal seemed to F. wholly inadequate to the offense by which his ducal dignity had been outraged, and in order to avenge this double slight, he organized an audacious plot, with the object of overthrowing the republic, and massacring the heads of the aristocracy, to be followed by his own assumption of sovereign rights. The conspiracy was, however, revealed on the eve of its execution, and F. was arrested, and suffered death by decapitation. In the hall of the great council, which contains the portraits of all the doges, the space allotted to that of F. is draped with

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a veil of sable, and bears the following inscription: 'Hic est locus MARINI FALETRO, decapitati pro criminibus.' A faithful representation of the plot, and of its chief confederates, is in Byron's drama *Marino Falieri*.

FALKIRK, *fál'kérk* (local pron. *faw-kérk*): Scottish parliamentary burgh, finely situated on rising ground in the midst of a populous mineral and manufacturing district in Stirlingshire, and overlooking an expansive 'Carse,' through which winds the river Forth. F. consists principally of along, irregular street, where there is an equestrian statue to the Duke of Wellington, erected by public subscription 1854. In 1859, a commodious Exchange was built; in 1868, excellent county buildings were erected, a new prison and county police-office. A hall, with accommodation for various studies, was opened 1878, for the Falkirk School of Arts. In 1600, F. was made a burgh of barony by King James VI., in 1646 a burgh of regality by King Charles I. In 1715, it passed to the crown by forfeiture. It has nine yearly fairs, extensive inland trade, various local manufactures, and charitable institutions. Its parish church—the Eglais Bhrec, Varia Capella, or Speckled Kirk of the chartularies and of local tradition—has one or two monuments of some antiquity, but was rebuilt 1810. The church, church lands, and barony belonged of old to the Abbey of Holyrood. Near F., 1298, Sir William Wallace made his masterly retreat from the disastrous battle (see FALKIRK, BATTLE OF), in which he lost his companions in arms, Sir John Graham and Sir John Stewart, both said to be interred in the parish churchyard. The inscribed stone alleged to cover the grave of Sir John Graham, is apparently more modern than his time. In 1746, the neighborhood of F. was the scene of another battle, in which the royal troops were defeated by those of Prince Charles Edward. It is now noted chiefly for its cattle-trysts (cattle fairs), at which stock is yearly sold to the value of about £1,000,000. In the immediate vicinity are the Carron Iron-works. F. is a station on the North British railway, and has water communication by the Forth and Clyde canal. Pop. (1891) 16,615.

FALKIRK, BATTLE OF: between the English and Scotch; near Falkirk, Scotland, 1298, July 22. Wallace had followed up his victory over the English near Stirling 1297, by taking possession of some of the more important fortresses of Scotland. In the following year, King Edward, having returned from Flanders, summoned a great army to meet him at York, and marched northward to Roxburgh, thence along the e. coast of Scotland and the shore of the Firth of Forth. It was not till the day of the battle, that Edward saw his adversaries. The Scottish infantry, much inferior in numbers to the English, were arranged in four circular bodies on a small eminence near Falkirk, armed with lances and with bows and arrows. The cavalry, numbering only 1,000 men, were placed in the rear. This array was charged by the English cavalry. The Scottish footmen bravely withstood the onset of the English horse; but the cavalry, dismayed by the preponderating numbers

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of the enemy, rode from the field without striking a blow. Thus left without support, the spearmen and archers were compelled to yield, and the retreat became general. The loss on the Scottish side is said to have amounted to 15,000 men. The results of this defeat were, that the military power of Scotland, such as it was, was broken; and Edward returned to England master of all the important strongholds of the south.

FALKLAND, *fawk'land*: royal burgh of Scotland, county of Fife, at the n. e. base of the Lomond Hills, 22 m. n. of Edinburgh, 10 m. s.w. of Cupar. The e. Lomond Hill rises so abruptly behind the town as to intercept the rays of the sun from it for several weeks during winter. F. was in early times a manor of the Earls of Fife. It passed from them to the crown 1425, and was made a royal burgh by James II. 1458. Within the town are the remains of Falkland Palace—a large tower (in the same style as the n. w. tower of Holyrood) above a vaulted doorway leading into the courtyard, built about 1500, and two sides of a quadrangle, built between 1530–50, fine and interesting examples of Scottish architecture. The palace was a favorite residence of King James IV., and after his death 1513, his widow, the impetuous sister of King Henry VIII. of England, was here kept in restraint for a season. Here her son, King James V., died 1542. The last king who occupied the palace was Charles II., who passed a few days in it 1650. Of the more ancient castle in which David, Duke of Rothesay, was imprisoned and starved to death by the Duke of Albany, 1402, no traces remain. The people support themselves mainly by handloom weaving. Pop. (1881) 1,068.

FALKLAND, LUCIUS CARY, Viscount: born, it is believed, at Burford, in Oxfordshire, England, 1610; d. 1643, Sep. 20. He was educated first at Trinity College, Dublin—his father, Henry Cary, Viscount F. being at that time lord-deputy of Ireland—and afterward at St. John's College, Cambridge. His earlier years were devoted to study, and to the conversation of learned men, among whom he himself seems to have occupied a first place. His residence (Burford) was only ten m. from Oxford with its scholarly company. F. is one of those historical personages whose character and abilities we must take, if at all, on the word of friends and panegyrists, like Clarendon; for his deeds and writings are not equal to his fame. In 1633, he was made one of the gentlemen of the privy-chamber to Charles I., and took part in the expedition against the Scots 1639. In 1640, he entered parliament as member for Newport in the Isle of Wight, and was at first distinguished by his patriotic zeal for the laws and constitution of his country. Against such men as Stafford and Finch he used great severity of speech, though even in their case his almost finical love of the forms of legal procedure was manifested. Shortly afterward he conceived it his duty to assume a different political attitude, and to oppose what he deemed the excesses and illegalities of the popular party. On the breaking out of the civil war, he consequently took

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part with the king, though mourning deeply the miseries which his country was about to suffer. He died a soldier's death at the battle of Newbury. F. was quite unfitted to take a practical part in the sanguinary politics of his time; but his love of the rights of the nation, which burned in him as strongly when a royalist as when attacking Stafford and the bishops, aids us to understand the deep indignation that possessed the English gentlemen who represented the commons, at the arrogant and unprincipled policy of Charles's advisers. F. wrote various treatises, etc., the principal of which is *A Discourse on the Infallibility of the Church of Rome*.

FALKLAND ISLANDS: the only considerable cluster in the s. Atlantic, about 300 m. e.n.e. of the Strait of Magellan, stretching in s. lat. from 51° to $52^{\circ} 30'$, and in w. long. from $57^{\circ} 40'$ to $61^{\circ} 20'$. After having successively belonged to France and Spain, they have, since 1771, formed part of the British empire; and in 1833 they began to be settled, being as a whole, the most southerly of the organized colonies of England. These islands number about 200, presenting a total area of about 6,500 sq. m. The two largest members of the group, E. Falkland and W. Falkland, comprise between them more than half the surface; and of the remainder, the chief ones are Great Swan, Saunders, Keppel, Pebble, Eagle, and Jason. This possession, with its many excellent harbors, is valuable mainly from its position with respect to the Southern and Pacific Oceans. Both the soil and the climate are much better adapted to pasturage than to cultivation. While the natural grass is extremely luxuriant, scarcely anything but a few vegetables is grown in the settlement. The coasts teem with fish, especially cod; and in certain seasons of the year, penguins and seals are killed in great numbers for their oil. The temperature is very different from that of the corresponding parallels in the s. of England, being both lower in summer and higher in winter. The mean of the former season is about 53° F., and of the latter, about 40° . These averages considerably exceed the vague estimates of early navigators, who, coming suddenly down from the tropical heats, appear to have here felt, by comparison, something of hyperborean cold. Though there is no timber worthy of the name, yet peat abounds to the depth of ten ft. Revenue of the colony 1880, £5,520; expenditure, £5,607. The annual value of imports varied 1877-80 from £33,000 to £39,000; of exports (chiefly wool, with oil, hides, tallow, and seal skins), from £51,000 to £88,000. There is some gardening near Stanley, the seat of government; and a little barley and oats is cultivated. There is only one indigenous quadruped found, a kind of fox. Large cattle are now numerous. The sheep are chiefly Cheviots and Southdowns. There are deposits of guano on W. Falkland. The governor, the executive council, and the legislative council of the F. I. are appointed by the crown. Pop. (1871) 803; '1880) 1,336, of whom, females 577; (1887) 1,843.

FALL.

FALL, *n.* *faul* [Icel. *falla*; Dut. *vallen*, to fall—connected with Gr. *sphallo*, I cause to fall]: the act of dropping or coming down from a higher to a lower place; descent; that which falls; a tumble; ruin; apostasy; decrease of price or value; a rush of water down a steep place; autumn; in *OE.*, cadence: *V.* to drop or come down from to higher to a lower; to descend; to depart from the faith; to perish; to decrease in price or value; to flow into, as a river; to sink; to come in or upon; to forsake; to happen; in *OE.*, to bring forth. **FAL'LING**, *imp.*: **ADJ.** descending; drooping; declining. **FELL**, *pt.* *fēl*. **FALLEN**, *pp.* *faul'n*: **ADJ.** degraded; ruined; decreased. **FALLIBLE**, *a.* *fāl'ti-bl* [L. *fallibilis*—from *fallēre*, to deceive]: liable to error or mistake. **FAL'LIBLY**, *ad.* *-blī*. **FAL'LIBIL'ITY**, *n.* *-bil'ī-tī*, liability to err or be deceived. **FALLER**, *n.* *-ēr*, one who falls; in *machinery*, an arm on a mule-carriage, operating the faller-wire, whose duty it is to depress the yarns when the carriage is about to run back; also a bar in the flax spreading machine, to which are attached a number of vertical needles, forming a comb or gills, which simulate the action of the human fingers in detaining to some extent the line as it passes to the drawing roller. **FALLING-HOME**, *a.* in *naut.*, term applied to the upper parts of the sides of a ship when they curve inward. It is called also tumbling home, and formerly, too, hausing-in. It is the opposite of wall-sided or flaring-out. **FALLING-MOLDS**, *n.* in *carp.*, the two molds which are applied, one to convex, the other to the concave vertical side of the rail-piece in hand-rails to form its back and under surface, and to finish the squaring. **FALLING-OFF**, *n.* degeneracy; change to the worse; in *naut.*, the opposite of *gripping* or *coming-up* to the wind. It is the movement or direction of the ship's head to leeward of the point whither it was lately directed, particularly when she sails near the wind or lies by; the angle contained between her nearest approach to the wind. **FALL-CLOUD**: same as **STRATUS**. **FALL-POISON**, in *bot.*, name in the United States for a melantheaceous plant, *Amianthium muscatoxicum*, so called because cattle feeding on its foliage in the fall of the year are poisoned. **FALLING-SICKNESS**, epilepsy (*q.v.*). **FALLING-STARS**, the familiar name for the meteorites seen in a state of combustion in the sky (see **METEORS**). **FALLING-STONES**, a familiar term for meteoric stones. **TO FALL ASTERN**, among *seamen*, to be passed or left behind; to move or be driven backward, as by a current. **TO FALL AWAY**, to lose flesh; to apostatize; to fade. **TO FALL BACK**, to recede; to retreat. **TO FALL BACK UPON**, to retreat for safety toward supports, as troops; to betake one's self to a reserved fund or a reliable resource for support. **TO FALL DOWN**, to come to the ground; to prostrate one's self in worship. **TO FALL FOUL**, to attack; to come into violent contact; to become entangled. **TO FALL FROM**, to recede from; to depart. **TO FALL IN**, to agree with; to enter among, as a body of soldiers arranged; to join. **TO FALL IN WITH**, to meet with, as a ship; to discover. **TO FALL OFF**, to withdraw; to forsake; to depreciate; to become less. **TO FALL ON**, to begin suddenly and eagerly;

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to rush against. To FALL OUT, to quarrel; to happen; to quit the place in the ranks. To FALL OVER, to change sides. To FALL SHORT, to be deficient. To FALL TO, to begin; to apply one's self to. To FALL UNDER, to come under or within the limits of. To FALL UPON, to attack. THE FALL OF THE LEAF, autumn: see DECIDUOUS TREES: LEAVES. THE FALL, the state of sin and misery into which our first parents were brought by their eating the forbidden fruit; the act itself; the autumn, when leaves fall.

FALL, n. *fawl* [F. *faillie*, a fishing-net]: a short veil worn over the bonnet by females; a veil.

FALL, n. *fawl* [O.Sw. *fale*, a pole or perch]: in *Scotland*, a measure nearly equal to an English perch or rood.

FALL, int. *fawl*: in *naut.*, the cry to denote that a harpoon has been effectively delivered into a whale.

FALL, DOCTRINE OF, in Theology: doctrine of the historical introduction of evil into the world, based on the narrative in Genesis, chap. iii., with other portions of the Bible which refer to the events there recorded. The doctrine assumes various forms, according to the interpretations which the record receives. Some theologians interpret the narrative more literally—though none do so quite literally;—others interpret it more figuratively as a poetic instruction; while others reject it altogether as a narrative, and look upon it merely as a mythical story of the early time—mirroring the lapse from a primitive golden age, or age of innocence.

1. Even the most orthodox theologians to some extent spiritualize the narrative, or regard it figuratively. The serpent, for example, is with them the devil, though the text in Genesis itself gives no hint of such an interpretation, which ultimately appears in the New Testament. The enmity between the serpent and the woman is the enmity between the devil and mankind; and the bruising of the head and the heel is supposed to represent the victory—though not without suffering—of Jesus Christ, as the Messiah, over the devil. Other particulars, less important, are conceded to be figurative. The doctrine of the Fall, according to the prevalent interpretation of orthodox divines, is stated in the Westminster Confession of Faith, c. vi.: 'Our first parents being seduced by the subtlety and temptation of Satan, sinned in eating the forbidden fruit. By this sin, they fell from their original righteousness, and communion with God, and so became dead in sin, and wholly defiled in all the faculties and parts of soul and body. They being the root of all mankind, the guilt of this sin was imputed, and the same death in sin and, corrupted nature conveyed to all their posterity, descending from them by ordinary generation.'—This definition, however, probably asserts more than multitudes of believers in both the narrative and the doctrine, now deem it necessary or desirable to assert. They are not anxious to criticise the narrative as though it were a logical formal statement, and they have little care to classify it according to certain liter-

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ary rules. Their ideas are not entangled in its mere garb or form. They take note of the main spiritual facts which it presents, and observing that these accord with all human history and experience, and that the most recent science gives some of them—e.g. the fact of heredity—increasing emphasis, they accept the main facts—the important meaning of the story; and thus accept the story as a true spiritual symbolism, and further, as true historically so far as its history is at all requisite for a vehicle of its deep truths. The *doctrine* of the fall which probably is the frequent result of such a view, may be generally stated thus: The first man was tempted by an evil spirit to disobey God; he yielded, and thus sin entered into the world, human nature fell into ungodliness; and all mankind, descending from the first man, have inherited a proneness to depart from God. This inherited evil manifests itself as sin in men soon as the moral nature issues into action. Restoration for the individual or for the race is only through a new importation of the lost Divine life by the coming in human flesh of the eternal Son of God, who was manifested as 'the seed of the woman' that he might redeem man and 'destroy the works of the devil.' Humanity, which fell in the first Adam, rises again and far higher in the second Adam.

2. Other theologians consider the third chapter of Genesis in the main allegorical—representing a picture of the violence of appetite in our first parents. More definite as to the form of the narrative, they tend to be less definite as to the doctrine. In this view, the serpent is a mere imaginary accessory—the emblem of temptation; the supposed interview between God and our first parents is of the same character—the emblem of the voice of conscience following unlawful indulgence: the tree of the knowledge of good and evil represents some form of sensual indulgence. The only realities in the picture are the moral realities, conscience and temptation in some carnal form—realities which were no more powerful in the case of our first parents than they are in the case of all their descendants who yield to unlawful indulgence, as they did. The doctrine of the Fall, according to this interpretation, is simply the doctrine of the abuse of free will in our first parents; and the question of the relation of this primary sin to all subsequent sin, is variously regarded by this class of theologians. All of them would repudiate any formal imputation of it; yet all or most allow some actual transmission or inheritance of corrupted will, as the consequence of the original abuse of it.

The Pelagian theory maintained, indeed, that the race was not the worse for Adam's fall; but that, as our first parents 'were to blame for yielding to a temptation which they might have resisted, so all of us, by a proper attention in cultivating our natural powers, may maintain our innocence amid the temptations with which we are surrounded: and, therefore, that we fall short of that which it is in our power to do, if we do not yield a more perfect obedience to the law of God than Adam yielded.' The Arminian

FAL-LA—FALLACIOUS.

theory, again contended that the chief loss of the race, as the consequence of the transgression of our first parents, was the subjection to death thereby incurred, and the moral disadvantages arising out of the fear of death. Others, more orthodox than either, contend that the spiritual unity of the race necessarily implies that the depraved will of our first parents has descended to their posterity as their unhappy portion.

3. The opinion of those who look upon the chapter in Genesis as a mere myth or fable, representing a dream of the religious imagination, without any special moral meaning, cannot be said to come within the pale of Christian theology. The doctrine of the Fall is with them only a devout idea, inconsistent with their principles of philosophy and history, and which, accordingly, they dismiss from their speculation or concern altogether.

FAL-LA, n. *fāl-lā'* [derived from *fal la*, with which each line or strain ended]: in *mus.*, a short song with the syllables *fal la* at the end of each line or strain. Morley (about 1580), who composed some of them, speaks of their being a kind of ballet. Those of Hilton (about 1600) are held in the highest estimation for freedom of construction and beauty of melodies. Gustildi is the reputed inventor of *fal-las*.

FALLACIOUS, a. *fāl-lā' shūs* [L. *fallaciōsus*, deceitful—from *fallo*, I deceive: F. *fallacieux*]: deceiving; deceptive; not well founded; producing error or mistake. FALLA'CIOUSLY, ad. -*lī*. FALLA'CIOUSNESS, n. FALLACY, n. *fāl-lā-sī* [F. *fallace*, deception, a fallacy—from L. *fallaciā*]: that which misleads the eye or the mind; deceptive appearance; a sophism.

FALLACY.

FALLACY: incorrect performance of the process of reasoning, so as to lead to error. The science of Logic (q.v.) reduces sound reasoning to certain rules, and when any of these rules is violated, a logical F. is the result. There is always included in logical treatises a chapter on fallacies, in which the several kinds are classified and illustrated. In all the old writers, there was a division into two classes, according as the error lay in the *form* of the reasoning, or in the *matter*; the formal were entitled *in dictione*, or those appearing in the expression; the material were entitled *extra dictionem*, implying that the fault must be sought in a consideration of the meaning or subject-matter. Some of the designations of this ancient classification have passed into common use; as follows:

The formal, those *in dictione*, were direct breaches of the laws of syllogism, or of argumentation from premises (see SYLLOGISM: DEDUCTION). The fallacy of *undistributed middle* is one of the cases where what is called the middle term of a syllogism is used in two senses. 'A term is said to be "distributed" when it is taken universally, so as to stand for everything that it is capable of being applied to; and, consequently, is "undistributed" when it stands for a portion only of the things designated by it. Thus, "all food," or every kind of food, are expressions which imply the distribution of the term "food;" "some food," would imply its non-distribution.' In such a proposition as 'all food is obtained from the vegetable or animal kingdom,' the term is distributed, because it is meant to be affirmed of every article used as food, that such article is derived from one or other of these two sources. But when we say 'food is necessary for life,' we mean only a limited number of articles. Hence such a syllogism as the following: 'Food is necessary to life; corn is food; therefore corn is necessary to life,' is faulty from undistributed middle; the major proposition, 'food is necessary,' etc., has the form of a universal proposition, with the reality of a particular one.—The *æquivocatio*, or *ambiguous middle*, is the case where a word is used in two senses so different as to give properly no middle term, and, therefore, no connecting link between the premise, and the conclusion. A favorite example of this is the following: 'Every dog runs on four legs; Sirius (the dog-star) is a dog; therefore Sirius runs on four legs.' This is merely playing with the ambiguity of a word. Dr. Whately has shown that this F. may often arise with words derived from the same root, but acquiring from usage different significations; thus, 'projectors are unfit to be trusted; this man has formed a *project*, therefore he is unfit to be trusted;' where the argument supposes that the meaning of 'projector' and 'one who has formed a project' is the same, which it is not.—The F. of *composition and division* arises by using a word distributively that is meant collectively; thus, 'five is equal to two and three; two and three are even and odd; therefore five is even and odd.'—'The F. of *accent* was an ambiguity arising from pronunciation. Thus, by a false accent in reading the commandment, "thou shalt not bear false witness against thy neighbor," it

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might be suggested that *subornation* is not forbidden, or that anything false except *evidence* is permitted, or that false evidence may be given *for* him, or that it is against *neighbors* that false witness is not to be borne.'—The *fallacia accidentis* is another form of the ambiguous middle. It is when we conclude of a thing something that is true of it only accidentally, as 'wine is pernicious, therefore it ought to be forbidden.' The premise is true of only the immoderate use, the conclusion refers to its use in every form. Another F., the converse of this, is arguing a *dicto secundum quid ad dictum simpliciter* (passing from what is true in some respect to what is true absolutely). Of this the stock example is: 'What you bought yesterday you eat to-day; you bought raw meat yesterday, therefore you eat raw meat to-day.'

The most usually quoted of the second class of fallacies—*extra dictionem*—are the following:—*Ignoratio elenchi*, or 'ignorance of the refutation.' This means mistaking the point in dispute; or proving something that an opponent does not deny. This is common in controversy. See an example in *ETHICS*.—The *petitio principii*, or 'begging of the question.' This is when, instead of proving a position by some different position, something is assumed that is identical with what is to be proved. The most common form of this F. is what is termed *reasoning in a circle*, where two propositions are made reciprocally to prove each other. The following would be an example of this mode of reasoning: Suppose we asked why smoke ascends, and any one were to answer, 'because it is light;' we then inquire how it is known to be light, and the reply is, 'because it ascends.'—The *non causa pro causa*. This is a F. of insufficient induction (see *INDUCTION*), or the inferring a connection of cause and effect where there is a mere sequence or accompaniment; as when we allege that the prosperity of England is due to its having an aristocracy, or an Established Church, or any other circumstance that has attached to the country, without ascertaining that there is any real causation between the two facts. Much of empiricism in medicine is of this nature; such a one took a certain medicine, and recovered from an illness, therefore the medicine was the cause of the recovery. The *post hoc, ergo propter hoc*, is another expression for the same F., which is one of wide range, and whose rectification far transcends the limits of scholastic or formal logic.—The *argumentum ad hominem* is a reference to the circumstances of the party addressed, and means that though a certain reasoning may be good in itself, such party is not entitled to urge it, having perhaps already repudiated the same reasoning in other cases, or acted in a manner inconsistent with the employment of it. (For a full exemplification of fallacies according to the foregoing enumeration, see De Morgan's *Formal Logic*, Whately's *Logic*, Sir William Hamilton's *Lectures on Logic*, etc.)

The subject of fallacies has received a much more comprehensive treatment in the work on Logic by John Stuart Mill, who has enlarged the basis of the science itself, by placing Induction at the foundation of Reasoning, and by

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recognizing the necessity of laying down rules for the correct performance of that process: see **INDUCTION**. This enables him to give a proper place to some of the preceding fallacies, such as the *post hoc, ergo propter hoc*, which, though occurring in treatises of syllogistic logic, does not violate any rule either of syllogism or of any process included in such treatises. In fact, if we take a complete view of all the cardinal operations that enter into the establishment of truth by evidence, we ought to enumerate four such operations—Observation, including experiment; Definition, or the right use of general terms; Induction; and Deduction or syllogism. Now any one of these operations badly performed would necessarily lead to a wrong result, in other words, a fallacy. But in addition to the mistakes arising from the admission of insufficient evidence at any point, there is a class of errors (as well as truths) that arise from our receiving propositions without any outside evidence at all, on the ground that they are self-evident. In every case of reasoning we must come at last to something that does not need a reason, as, for example (as a general principle), the evidence of our senses, or our actual observation, but we may sometimes admit as self-evident what is really not so, owing perhaps, to our having a strong sentiment in the matter on hand. It is usual to consider the existence of an external material world altogether independent of our minds, as certain in itself without requiring any proof or reason for the belief. It is found that we often commit mistakes in this way, and the mistakes thence arising Mr. Mill illustrates under the title of Fallacies of Simple Inspection, or Fallacies *à priori*, which includes the whole of what may be termed Natural Prejudices. The other members of his classification follow his division of the processes concerned in the investigation of truth: They are Fallacies of Observation, Fallacies of Generalization, including Induction, and Fallacies of Ratiocination or syllogism. He remarks, moreover, that error does not often take the form of a deliberate infringement of the rules of good observation, induction, or deduction, but consists rather in a confused perception of the premises involved. In other words, it is the 'not conceiving our premises with due clearness, that is, with due fixity; forming one conception of our evidence when we collect or receive it, and another when we make use of it; or unadvisedly, and in general unconsciously, substituting, as we proceed, different premises in the place of those with which we set out, or a different conclusion for that which we undertook to prove. This gives existence to a class of fallacies which may be justly called Fallacies of Confusion; comprehending among others, all those which have their source in language, whether arising from the vagueness or ambiguity of our terms, or from casual associations with them.' It is in this group that Mr. Mill places the *petitio principii*, the *ignoratio elenchi*, and ambiguous language generally (*Logic*, Book v.).

The scholastic fallacies were considered mostly in the light of weakness or involuntary errors of the intellect, to be corrected by sound rules or a good method of proce-

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ture. The syllogistic logician made little count of the natural prejudices, or strong emotions and passions of mind, which forcibly pervert the intellectual views, and render men averse to sound reasoning. This grand omission was first effectively supplied in the immortal first book of the *Novum Organon* of Lord Bacon, who, in a vigorous and telling exposition, set forth some of the most powerful prejudices of the natural mind, and their influence in corrupting science and philosophy as well as the everyday judgments of mankind. Under the name of 'idola' (idols, vain images in the mind), he classed four different species of these moral sources of error, against which the mind had to be fortified, not by syllogistic rules, but by a self-denying discipline, and a highly cultivated perception of the true end of science, which was to increase human power in all the arts of life. His first class of idola were *idola tribus*, or delusions common to the human mind generally, such as errors of the senses, the over-susceptibility of the mind to impressions of sense, the limits of the human faculties, and the interference of prejudices and passions; a very comprehensive class, which even he has failed to do justice to. The next class are *idola specûs* (idols of the den or cavern), by which he understands the peculiarities and idiosyncrasies of individuals. The third class, *idola fori* (idols of the market or of the place where men assemble and exchange views) are intended to include the abuses of language, or the various ways in which our conceptions of things are distorted by names. The last class are the *idola theatri* (theatrical illusions), under which he rebukes the great system-builders of antiquity, such as Aristotle, for introducing fanciful and irrelevant considerations into philosophy; and dwells especially on the corrupting influences of superstition and speculative theology, also on the poetical tendencies of the mind, which are not satisfied with truth unless it can take on a certain warmth or brilliancy of coloring.

FALLIBILITY, FALLIBLE: see under **FALL 1.**

FALLING BODIES.

FALLING BODIES. substances descending toward the earth's centre. Owing to gravity (q.v.), all terrestrial bodies, if unsupported, *fall*, or move toward the earth's centre. The theory of the descent of bodies under gravity was discovered and first taught by Galileo (q.v.). When a falling body is absolutely without support, it is said to fall freely, as distinguished from one descending an inclined plane or curved surface.

1. *Bodies falling freely.*—The first fact of observation regarding falling bodies is that they fall with a variable velocity; from this we infer that they are acted upon by some force. Again on observing how the velocity varies, we find that its increments in equal times are equal; from this we conclude that gravity is a uniform force, which it is, at least sensibly, for small distances above the earth's surface. We have next to find a measure for this force. By experiment, it is found that a body in 1" falls through 16.1 ft., and that at the end of 1" it moves with such a velocity, that if it continued to move uniformly after the 1" expired, it would pass over 32.2 ft. in the next second. Hence 32.2 ft. is the measure of the velocity which has been generated in 1", and is therefore the measure of the accelerating force of gravity; for the measure of accelerating force is the velocity which it will produce in a body in a second of time. The quantity 32.2 ft. is usually denoted by the letter g ; and it is to be noted that this quantity measures the accelerating force of the earth's attraction on all bodies. Experiment shows that under the exhausted receiver of an air-pump all bodies fall with equal rapidity, and that the difference of velocities of falling bodies in air is due entirely to the action of air on them.

As the accelerating force is uniform, it follows that the velocity generated in any time, t , will be given by the formula $v = gt$. Since the force is uniform, it must generate an equal velocity every second. In 1", therefore it must generate a velocity gt , since it produces g in 1". In 2", a falling body will be moving with a velocity of 64.4 ft.—i.e., were the velocity to become constant for the third second, it would in that second move through 64.4 feet.

We are now in a position to inquire more particularly how bodies fall, and to answer such questions as first: What time will a body falling freely take to fall through a given space? Second: What velocity will it gain in falling through a given space? Third: How high will a body ascend when projected straight up with a given velocity? etc. Let A be the point from which a body falls, and B



its position at the end of the time t ; and let $AB = S$. Then we know that at B the body has the velocity gt . Suppose, now, the body to be projected upward from B toward A with this velocity gt —gravity acting against it, and tending to retard its motion. We know that at the end of a time t it will be again at A, having exactly retraced its course, and lost all the velocity with which it started

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from B, because gravity will take just the same time to destroy the velocity gt which it took to produce it. From this consideration we may obtain an expression for the space AB or S in terms of the time t . In the time t , the body rising from B with a velocity $= gt$ would ascend, if not retarded, a height $(gt) \cdot t$, or gt^2 . But in the time t , gravity, we know, carried it through S; it will therefore, in the same time, by retarding it, prevent it going to the height gt^2 by a space $= S$. The space through which it actually ascends is then represented by the difference $gt^2 - S$; but this space we know to be AB or S. Therefore $S = gt^2 - S$; or $2S = gt^2$, or $S = \frac{1}{2}gt^2$. We may give this equation another form. For v being the velocity acquired in the time t , $v = gt$, $\therefore t = \frac{v}{g}$. Then $S = \frac{1}{2}g \cdot \frac{v^2}{g^2} = \frac{v^2}{2g}$. Hence $v^2 = 2gS$. From these formulæ, we see that when a body falls from rest under the action of gravity, its velocity at any time varies as the time, and the square of its velocity as the space described.

If the body, instead of starting from rest has an initial velocity V ; and if v , as before, be the velocity at the time t , then evidently v is $=$ the original velocity $+$ that which is generated by gravity, or $v = V + gt$; and the space will be that which would have been described by the body moving uniformly with a velocity V $+$ that which it would describe under gravity alone, or $S = Vt + \frac{gt^2}{2}$. With regard to the last two formulæ, it is easy to see that they may be made to suit the case of a body projected upward with a velocity V , by a change of signs; thus, $v = V - ft$, and $S = Vt - \frac{gt^2}{2}$; gravity here acting to destroy velocity, and diminish the height attained. From the general formulæ in the case of an initial velocity, whether the body be projected upward or downward, we may express v in terms of S , as we did in the case of motion from rest. For $v^2 = (V \pm gt)^2 = V^2 \pm 2g(Vt + \frac{gt^2}{2}) = V^2 \pm 2gS$.

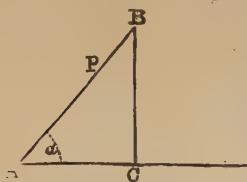
These are all the formulæ applicable to the case of falling bodies, and by their means all problems in this branch of dynamics may be solved. It appears also that the formulæ above investigated apply to all cases of rectilinear motion of bodies considered as particles under the action of any uniform force. In all such cases, if f measure the accelerating force $S = \frac{1}{2}ft^2$, $v^2 = 2fS$, for the case of motion from rest; and $S = Vt \pm \frac{1}{2}ft^2$, and $v^2 = V^2 \pm 2fS$, for the case of an initial velocity.

Any one can easily frame for himself examples illustrative of the formulæ. We subjoin one: A stone falls down a well, and in 2'' the sound of its striking the bottom is heard. How deep is the well? Neglecting the time occupied in the transmission of sound, the formula $S = \frac{1}{2}gt^2$ applies, or $S = \text{depth} = \frac{1}{2}g \cdot 2^2$, t being 2''; \therefore depth $= 2g$, or 64.4 feet.

2. *Bodies descending inclined planes.*—In this case the for

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mulas already investigated apply with a slight change. In



the figure, if P be a body on the inclined plane AB, descending under gravity we observe that only that resolved part of gravity parallel to AB is effective to make it descend, the other part at right angles to AB merely producing pressure on the plane.

The angle of inclination of the plane being a , we know (see COMPOSITION and RESOLUTION OF FORCES) that the resolved part of gravity parallel to the plane is $g \sin. a$. The body, then, may be conceived to be descending under a uniform accelerating force $g \sin. a$. We obtain the formulæ accordingly, for descent on inclined planes by substituting $g \sin. a$ for f in the general formulæ given above. We notice, however, that in descent on inclined planes the velocity acquired is, as in the case of bodies falling freely, due solely to the vertical height through which the body falls. By our formula, $v^2 = 2g \sin. a \cdot S$, where $S = AB$, if the body falls from B. This may be written $v^2 = 2g \cdot S \cdot \sin. a$, or $= 2g \cdot AB \cdot \sin. a$, or $= 2g \cdot BC$, since $AB \cdot \sin. a = BC$. But this is the same as the velocity acquired by a body in falling freely through BC. In fact, it holds generally true, that the velocity acquired by a body falling down the surface of any smooth curve is that due to the vertical height through which it has fallen; which might be proved in various ways, but is sufficiently clear from this, that any curve may be considered as a succession of inclined planes, indefinitely short in length and great in number; for the proposition being true, as above proved, for each of them, will be true for all, and therefore for the curve.

For an account of the variations of the value of g , due to the earth not being a perfect sphere, and other causes, see EARTH: see also ATWOOD'S MACHINE.

FALLMERAYER, *fäl'meh-rî-ër*, JACOB PHILIPP: 1791, Dec. 10—1862; b. Tschotsch, near Brixen in the Tyrol: German traveller and historian. He studied at Brixen, and 1809 went to Salzburg, where he gave instruction in history and Latin. At the Univ. of Landshut, he studied law, history, and philology. When Germany rose against Napoleon 1813, he entered the Bavarian army, and took part in several engagements. After peace F. returned to his studies. In 1826, he was appointed to the chair of history and philology at Landshut. In 1831, he accompanied the Russian gen., Count Ostermann-Tolstoy, in a journey to the East, visiting Egypt, Palestine, Syria, Cyprus, Rhodes, Greece, Turkey, and Italy. During 1830-40, he resided with Count Ostermann-Tolstoy at Geneva, and in the next eight years twice revisited the East. The events of 1848 recalled him to Bavaria, and for a short time he sat as a deputy to the Frankfurt parliament, but after 1850 he lived privately in Munich. F. was a distinguished polyglot, and spoke a great number of European and Oriental tongues. His principal works are, *Geschichte des Kaiserthums Trape-*

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zunt (Münch. 1831), *a. Geschichte der Halbinsel Morea im Mittelalter* (2 vols. Stuttg. 1830-36), and *Fragmente aus dem Orient* (2 vols. Stuttg. 1845). His views on the origin of the modern Greek language have excited the liveliest controversy in Greece and elsewhere. A complete ed. of F.'s works appeared at Leipsic 1861, entitled *Gesammelte Werke von Jakob Philipp Fallmerayer*.

FALLOPIAN, *a. fāl-lō'pī-ăn* [from *Fallōpīūs*, reputed discoverer]: in *anat.*, denoting certain ducts or tubes through which the ova pass to the uterus.—The Fallopian Tubes, or oviducts, are named after Fallopius usually but incorrectly regarded as their discoverer. They are canals four or five inches in length in the human subject, opening at their inner extremity into the upper angle of the uterus or womb, and at the other end, by a fringed funnel-shaped termination, into the cavity of the peritoneum. This fringed or fimbriated extremity at certain periods grasps the ovary, and receives the ovum, which is discharged by the rupture of the Graafian vesicle: see OVARIES. The ovum usually passes along the Fallopian tubes into the uterus, where it is either impregnated by contact with one or more spermatozoa, or is absorbed. Sometimes, however, the ovum becomes not only impregnated but retained, and further developed in the Fallopian tubes, thus giving rise to one of the forms of extra-uterine pregnancy.

FALLOPIUS, *fāl-lō'pī-ūs*, GABRIEL: celebrated anatomist; b. at or near Modena, about 1523 (quite uncertain); d. 1562. According to the above date he was only 25 years old when promoted from the Univ. of Ferrara to a professorship at Pisa, whence, after a few years, he was called to Padua, to succeed Vesalius, who had been compelled by the Inquisition to resign his office: see VESALIUS. Cuvier characterizes F. as one of the three *savants* who restored rather than created the science of anatomy in the 17th c., the two others being Vesalius and Eustachius. After his short but brilliant career was ended by death, he was succeeded by his favorite pupil, Fabricius ab Acquapendente (q.v.).

He published numerous works in various departments of medicine, of which the most important is *Observationes Anatomicae, in libros quinque digesta*, 1561, in which he corrected many errors into which his predecessor, Vesalius, had fallen. He was the first to describe with accuracy the ethmoid and sphenoid bones, and the minute structure of the ear (the canal along which the facial nerve passes, after leaving the auditory, is still known as the aqueduct of Fallopius); the muscles of the soft palate, and the villi and valvulae conniventes of the small intestines. In some of his supposed discoveries, he had been long anticipated; for example, the tubes passing from the ovary on either side to the uterus, which bear his name, were known to, and accurately described by, Herophilus and Rufus of Ephesus, 300 years B.C. In addition to his anatomical fame, he had reputation as a botanist: he was supt. of the botanical garden at Padua; and a genus of plants, *Fallopia*,

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has been named after him. A complete ed. of his works, four folio vols., was published 1600.

FALLOUX, *fâl-lô'*, FRÉDÉRIC ALFRED PIERRE, Comte DE: French author and statesman; b. Angers, 1811, May 11. His family was distinguished for its legitimist zeal, and at the Restoration was rewarded by letters of nobility. Young F. first drew attention by two works showing ardent love of the old Bourbon order of things—*L'Histoire de Louis XVI.* (Paris 1840, and *L'Histoire de Saint Pie V., Pape, de l'Ordre des Frères prêcheurs* (Paris 1844). These indicate the level of his political and religious faith. In the elections of 1846, he was chosen deputy for the dept. Maine-et-Loire. In religion, he advocated the ideas of Montalembert; in politics, those of Berryer, but united with his legitimist sentiments a love of liberty and education strangely incongruous with the historic character of his party. After the revolution of 1848, Feb., he showed much energy as a member of the constituent assembly, was one of those who organized the resistance to the insurrection of May 15, and, as reporter on the national workshops, pronounced for their immediate dissolution. He was also one of the most ardent promoters of the expedition to Rome. After the election of Louis Napoleon to the presidency, F. was appointed minister of public instruction, an office which he held only ten months. After the events of 1851, Dec. 2, he retired from public life to a country seat near Angers, where he has occupied himself with agriculture. In 1857 he was admitted a member of the French Acad., and published at Tours his *Souvenirs de Charité*. He published, 1859, *Mme Swetchine, sa Vie et ses Œuvres*; 1863, *Méditations et Prières*; 1864, *La Convention du 15 Septembre*; 1865, *Itinéraire de Turin à Rome*; 1866, *Lettres inédites de Mme. Swetchine*.

FALLOW, a. *fâl'lô* [F. *fauve*; OF. *faube*, a deep yellow—from Ger. *falb*, pale: AS. *fealo*, pale-reddish, or yellowish]: applied to a species of deer (see below): in OE., pale-brown, with tinge of red or yellow.

FALLOW, a. *fâl'lô* [AS. *fealo*, yellowish: Icel. *fölr*, pale: Dut. *vaal*, fallow, faded: Scot. *fail*, a sod or turf: Sw. *vall*, sward: prov. Dan. *felde*, to give a first shallow plowing: comp. Gael. *falamb*, empty]: applied to land which has lain a year or more untilled; denoting land plowed but not seeded for the season; neglected: V. to plow up land without seeding it. FALLOWING, imp.: N. the operation of plowing land not meant to be sown. FALLOWED, pp. *-lôd*, plowed and opened up to the air for the season. FALLOWNESS, n. exemption from bearing fruit. TO LIE FALLOW, to lie uncropped; to rest; to remain unexercised.—*Fallow* signifies sometimes waste, untilled land; but usually plowed and otherwise stirred for a season without being cropped. The most of the wheat raised by the Romans was sown after the land was fallowed; indeed, the usual rotation was fallow and wheat alternately. It was only fertile soils that could long support such an exhausting system; hence resulted the decreasing produce

FALLOW CHAT—FALLOW DEER.

which the later Roman agricultural authors so often lament.—The fallowing of land was introduced into all the countries which fell under the dominion of the Romans. During their sway in Britain, that country soon exported large quantities of wheat; and for centuries after the Romans left it, no other mode of cultivating the land was followed. Wherever the system of fallowing, without giving manure to the crops, is practiced, it necessarily supposes that the soil is at least moderately fertile. This system is most successful on argillaceous soils, retentive of organic manure. It must be borne in mind that the chief use of fallow is to liberate the plant-food already stored in the soil as organic matter. The plowing and stirring, by admitting air, promote decomposition, in the same manner as the turning over of a dunghill does; they also destroy the roots of the weeds that impoverish and choke the crops. In the most retentive clay-soils, fallowing affords the only means of thoroughly cleaning the land. Where there is a rotation of beans, clover, oats, fallow, wheat, and barley, each field is subjected to a process of fallowing once in every six, seven, or eight years. Fallow-fields usually receive a deep furrow in autumn. Lying exposed through the winter, the frost pulverizes the surface. In spring, when the weather becomes dry, the cultivator or the plow opens up the soil, and the process of extirpating the weeds goes on. Sometimes as many as three or four furrows are given in summer before the seed is sown in autumn. In old cultivated countries, land is commonly so much reduced in its organic matter, that fallows receive dressings of farm-yard manure, rape-dust, or guano, to obtain fertility. Since the general introduction of green crops, the term fallow has departed in some measure from its original meaning. These crops are sown on what was formerly the fallow-break, and are now often styled fallow-crops. The land, no doubt, receives in some measure a fallowing, as the green crops are cultivated by the plow during their growth. Bastard-fallowing is a term used in Scotland when hay-stubble land is plowed in the end of summer, freed from weeds, and sown with wheat in autumn.

FALLOW CHAT: see WHEATEAR.

FALLOW DEER (*Dama vulgaris* or *Cervus Dama*): species of deer commonly kept in *parks*, in most parts of Europe. It is probably a native of the countries around the Mediterranean, and has been introduced by man into the more northern parts of Europe, where it is now in some places found wild in forests. It is doubted whether it has not been introduced by man, at a remote period, from n. Africa even into the south of Europe. How far its geographic range extends eastward, is not certainly known. It is represented in the sculptures of Nineveh. Its introduction into Britain is ascribed to James VI. of Scotland, who is said to have brought it from Norway when he brought home his queen, Anne of Denmark, and after his accession to the English throne, to have transported it to Enfield and Epping. Thousands of F. D. are

FALL RIVER.

now in some of the English parks. They generally receive some attention and supplies of fodder in winter.

In size, the F. D. is smaller than the stag or red deer, from which it differs also in its broad palmated antlers, longer tail, and smoother and finer hair. In color, it is



Fallow Deer (*Cervus Dama*).

generally yellowish brown in summer; darker, or even blackish-brown in winter; more or less spotted with pale spots, particularly in summer and when young; but in one variety the spots are very marked; in another they are not to be observed even in the young. The buttocks are white, and a dark line passes along the back. White F. D. are sometimes seen. The female has no horns. The male is called a BUCK (Fr. *daim*), the female a DOE (Fr. *daime*), the young a Fawn (Fr. *faon*). The name F. D. is derived from its color. When the F. D. and red deer are kept in the same park, the herds seldom mingle, nor do hybrids occur. The F. D. loves the woods. The flesh of the F. D. is one of the most esteemed kinds of venison. The remains of fossil species nearly allied to the F. D. occur in some parts of Europe. The great fossil Irish *Elk* (q.v.) is allied to it.

FALL RIVER: city, manufacturing centre of Bristol co., Mass.; on Taunton River, Mount Hope Bay, and the R. I. border; on the Old Colony Providence Warren and F. R., and the F. R. and New Bedford railroads; lat. 40° 42' 3" n., long. 71° 9' 37½" w., 13 m. n.w. of New Bedford, 18 m. s.e. of Providence, 19 m. n.n.e. of Newport, 20 m. from the sea, 48½ m. s. of Boston. F. R. is built on a bold, dome-like elevation rising out of Mount Hope Bay, an e. branch of Narragansett Bay, and rests upon an immeasurable boulder of granite, or primitive rock. A single creek from Watuppa Lake on the plateau e., crossing the city and making a headlong plunge into the bay near the present sound steamboat landing, gave it its name. F. R. counts among its advantages as a manufacturing place a remarkably fine head of water—a fall of more than 130 ft. in a run

FALMOUTH.

of less than half a mile, and a splendid harbor at the head of Mount Hope Bay. Its wharves are accessible to the largest steamships. The city is beautifully laid out, contains numerous buildings of granite quarried in its vicinity is supplied with water from Watuppa Lake by works that cost \$1,500,000, has a public park with an area of 60 acres, is lighted by gas and electricity, has an efficient fire department, and ample street railway service. Its notable buildings include a handsome granite city hall, Rom. Cath. convent, custom house, free public library and reading room, children's home, high school, 7 grammar schools 23 intermediate schools, 32 primary schools, 7 national banks (cap. \$2,123,000), 4 savings banks, 2 private banks, and 35 churches: Rom. Cath. 9, Meth. Episc. 8, Congl. 4, Prot. Episc. 3, Christian 3, Bapt. 2, Presb. 2, Unit., Friends, Mormons, New Jerusalem, 1 each. Its chief industry is the manufacture of cotton. The first cotton mill erected here, subsequently turned into fruit works, was built 1811; and the first manufacturing enterprise of any moment began 1813, when two companies were formed, one with a cap. of \$50,000, the other with \$40,000. In 1865 there were 265,328 spindles in operation; 1869, 540,614; 1876, 1,269,048; 1892, 2,208,134. The number of looms increased from 30,144 in 1876 to 51,446 in 1892. In 1890 there were 312 manufacturing establishments, using a capital of \$36,513,620, employing 22,822 persons, paying \$8,314,811 in wages, and yielding products valued at \$31,029,451. In 1895 a capital of over \$21,000,000 was employed in 36 cotton mills, producing 467,250,000 yards (chiefly print cloths) per annum; calico print works with nearly 1,000 hands, 20 machines, and a productive capacity of 1,485,000 yards per annum; a woolen factory; spool and bobbin factory; bleachery; and numerous enterprises necessitated by the cotton industry. Next to cotton ranks the manufacture of nails, the different works producing 120,000 kegs per annum by machinery.—Mount Hope was the home of King Philip and the Namponoy Indians. The site of F. R. was settled 1659, became a part of the proprietary of Freetown, was set off and incorporated under its present name 1803, had its name changed to Troy 1804, and was so called till 1834, when it again assumed that of F. R., and received a city charter 1854. For a long time it was on the border line, and the subject of continual litigation between the states and people of Mass. and R. I., but the boundary question was settled and F. R. recognized as a possession of Mass. 1861. Pop. (1860) 14,026; (1870) 26,766; (1880) 48,961; (1885) 56,863; (1890) 74,398.

FALMOUTH, *fāl'mūth*: parliamentary and municipal borough and seaport in the s.w. of Cornwall, on a branch of the estuary of the Fal. 14 m. n.e. of Lizard Point, 269 m. w.s.w. of London. It consists chiefly of a narrow street, a mile long, on the s.w. of the harbor, and of beautiful suburban terraces and villas on the heights behind. The harbor, one of the best in England, is formed by the estuary of the Fal, 5 by 1 to 2 m. in extent, 12 to 18 fathoms deep, and affording shelter to 500 vessels at a

FALSE.

time. The mouth is defended on the w. by Pendennis Castle, on a rock 198 ft. high, and which resisted a siege by Cromwell for six months; on the e. by Mawes Castle—both built by Henry VIII. F. was, till recently, one of the principal packet-stations for foreign mails. In 1880, the entries inward were 1,057 vessels, of 167,897 tons; clearances outward 984 vessels, of 124,904 tons. There is a great pilchard-fishery off the neighboring coasts. The chief exports are tin, copper, pilchards, and fuel. Here orange and lemon trees yield plenty of fruit on open garden walls. F. arose in the middle of the 17th c., Sir Walter Raleigh having at an earlier period drawn public notice to its capabilities; and it has since been a rendezvous for fleets and mail-packets proceeding abroad.—Pop. of municipal borough (1891) 4,273, of parliamentary borough, which includes Penrhyn, and returns one member, 18,072.

FALSE, a. *fauls* [OF. *fals*—from L. *falsus*, deceived: Ger. *falsch*; Icel. *falskr*, false: comp. Gael. *fallsa*, false, deceitful]: not true; not real or genuine; inaccurate; counterfeit; deceitful; treacherous: V. in *OE.*, to violate truth; to deceive; to feign. **FALS'ING**, imp. **FALSED**, pp. *fälst*, deceived; falsified. **FALSE'LY**, ad. -*ly*. **FALSE'NESS**, n. state of being false; double-dealing; treachery. **FALSE-ATTIC**, n. -*ät'ik*, in *arch.*, attic without pilasters, casements, or balustrades, used for crowning a building, and bearing a bas-relief or inscription. **FALSE-BARK**, n. in *bot.*, layer on the outside of the stem of an exogen, which consists of cellular tissue with fibrous tissue entering it obliquely. **FALSE-BEDDING**, n. in *geol.*, cross bedding in which the minor layers are not parallel to the principal ones. Prof. Sedgwick says that there are three distinct forms of structure exhibited in certain rocks throughout large districts: Stratification, Joints, and Slaty Cleavage. The first of these constitutes true bedding; the others may be classed together as false-bedding. Joints are natural fissures which often traverse rocks in straight and well-determined lines. Slaty cleavage, which is best seen in the clay, slate, and other metamorphic rocks, generally crosses the true planes of stratification at a high angle. The rock can be cleft into fissile layers parallel to the cleavage. **FALSE-BLOWS**, n. in *bot.*, the staminate flowers of the melon and cucumber; because they produce no fruit. **FALSE BROME-GRASS**, a name applied to *Brachypodium*, a genus of grasses consisting of about a dozen species, natives of temperate countries. Glumes very short and empty. **FALSE-CORE**, n. in *foundries*, a part of a pattern which is used in the undercut part of a mold, and is not withdrawn with the main part of the pattern, but removed by a lateral draft subsequently. **FALSE-FIFTH**, n. in *mus.*, a fifth altered from its perfect or major state. **FALSE-FIRE**, n. in *naut.*, a blue flame, made by the burning of certain combustibles in a wooden tube, and used as a signal in the night, and for deceiving the enemy; called also blue flame. **FALSE-HEART'ED**, a. treacherous. **FALSE'HOOD**, n. a lie; an untruth (see **FRAUD**). **FALSE-KEEL**, n. in *naut.*, a keel, generally of elm, and composed of several pieces. It is fitted under

FALSE—FALSE BAY.

the main keel, to preserve it from friction, and to make the ship hold a better wind. In a ship that is not intended to be often in harbor, where it may ground, the false keel is slenderly secured, so that, if by accident the ship should ground, it may come off without damage. FALSE-NERVED, n. in *bot.*, applied to veins which have no vascular tissue, but are formed of simple elongated cellular tissue, as is the case in mosses, sea-weeds, etc. FALSE-PARSLEY, n. in *bot.*, *Aethusa Cynapium*. FALSE-RAIL, n. in *naut.*, thin piece of timber attached inside of a curved head-rail, in order to strengthen it; a facing or strengthening rail faced to a main rail. FALSE-RELATION, n. in *mus.*, the occurrence of chromatic contradiction in different parts or voices, either simultaneously or in chords so near together that the effect of one has not passed before the other comes to contradict it with a new accidental. FALSE-ROOF, n. in *arch.*, open space between the ceiling of an upper apartment, and the rafters of the outer roof; a garret. FALSE-WORKS, n. in *civil eng.*, construction works for the erection of the main-works. Coffer-dams, bridge-centring, scaffolding, etc., are false-works. FALSIFY, v. *faul'si-fi* [L. *faciō*, I make]: to make something appear true which is really false; to prove to be false; to forge; to violate the truth. FALSIFYING, imp. FALSIFIED, pp. *fid*. FALSIFIER, n. one who. FALSIFICATION, n. *-fi-kā-shūn*, quality of being false; the act of making a thing appear what it is not. FALSITY, n. *-si-ti*, an untruth from ignorance or mistake. FALSER, n. in *OE.*, a false or deceitful person.—SYN. of 'falsehood': falsity; fabrication; fiction; treachery; perfidy.

FALSE, RULE OF, or FALSE POSITION: mode of reckoning in cases where a direct solution of the question is impracticable. Any number is chosen at hazard, as that which is sought; this *false position* of course gives a false result, and from the amount of the error, it is ascertained by proportion what the assumption ought to have been. *Ex.* What number is that whose half exceeds its third by 12? Assume 96 at random; $48 - 32$ gives 16, which is too great; $\therefore 16 : 12 :: 96 : 72$, the number required. This method is now mostly superseded by the use of equations.

FALSE AND PRETEND'ED PROPHE'CIES, with intent to disturb the public peace: punishable as crime under the common law in England by several old statutes, unrepealed, but no longer enforced.

FALSE BAY: inlet which may be referred either to the Atlantic, the Southern, or the Indian Ocean. It washes the e. side of the mountainous district of S. Africa, which terminates in the Cape of Good Hope, and extends e. along the coast as far as False Cape; about 22 m. in length, and about the same in breadth. F. B. is sheltered from the n.w. monsoon, to which Table Bay—the harbor of Cape Town—is supposed: this advantage is especially possessed by Simon's Bay, at its n.w. extremity. Hence, besides periodically receiving trading-vessels from Cape Town for temporary protection, it is permanently the station of the naval force of the colony.

FALSE IMPRISONMENT—FALSE PRETENSES.

FALSE IMPRISONMENT: confinement or detention by another, without cause, or without legal cause. Every confinement of the person is an imprisonment, whether it be in a common prison or a private house, or in the stocks, or even by forcibly detaining one in the public streets (Coke, *Inst.* ii. 482). Thus, where a man gives another in charge for committing an offense, the former is liable to an action for false imprisonment, if he fails to substantiate his case. Police-officers, also, are liable for apprehending a man without a competent warrant, or without reasonable suspicion. But where a felony has been committed, an officer is entitled to arrest on suspicion. Not only constables but private persons may arrest a man who commits a felony in their presence. A person who has falsely imprisoned another is liable to a criminal prosecution, and also to a civil action. Any one detained without sufficient cause is entitled to apply for a writ of *Habeas Corpus* (q.v.) to procure his liberation. In Scotland, this species of offense is called Wrongous Imprisonment.

FALSE NEWS or RU'MORS: a crime under the common law of England. Spreading false news to make a discord between the sovereign and nobility, is a misdemeanor. The law before the Conquest had been more severe, and required that the author and spreader of false rumors should have his tongue cut out, if he redeemed it not by estimation of his head (or capitation tax). One of the articles against Cardinal Wolsey was founded on this principle of common law. 'Also the said cardinal has busied and endeavored himself by crafty and untrue tales against your nobles of your realm.'—Coke, *Inst.* iv. 92. The feeling of the present day is more in accordance with the axiom of Tacitus, *Convicia, si irascereis, tua divulgas, spreta excolescunt* (if you seek to revenge slanders, you publish them as your own; if you dispise them, they vanish).

FALSE PRETENSES, OBTAINING MONEY BY: one of various kinds of fraud. Under the English common law, mere fraud not amounting to felony, was not indictable unless it affected the public. Examples of fraud indictable at common law were—the use of false weights and measures; the sale of goods with counterfeit marks; playing with false dice; and frauds affecting the course of justice. Offenses like the first three named, known technically as 'cheats' derived their significance from the fact that they were perpetrated by means of false tokens or symbols. The use of such tokens brought them within the principle that the injury, to be indictable had to be of a public character. While many statutes prohibiting particular kinds of cheating in specified trades had been enacted from early times, the necessities of commerce made it apparent that unless the boundaries of the law respecting the offense generally were enlarged, many cases of grievous fraud would go unpunished. This extension of the law, so as to embrace the numerous varieties of verbal frauds, though gradually accomplished, proceeded very slowly. The first generally statute on the subject in Eng-

FALSE PRETENSES.

land, namely, 33 Hen. VIII. chapter 1, enacted by the parliament of 1541-42, made frauds accomplished by means of false tokens and counterfeit letters practiced on individuals, misdemeanors. This statute is usually regarded as simply declaratory of the common law existing at the time. The statute did not apply to any *verbal* misrepresentations by means of which many frauds might be accomplished. The statute of 30 George II. chapter 24, was therefore passed by the parliament of 1757. This law directed 'that all persons who knowingly and designedly by false pretense or pretenses shall obtain from any person or persons money, goods, wares, or merchandises with intent to cheat or defraud any person or persons of the same, shall be deemed offenders against law and the public peace, and the court before whom such offenders shall be tried, shall on conviction, order them to be fined and imprisoned, or to be put in the pillory, or publicly whipped, or to be transported for seven years as the court shall think fit.' But new kinds of property, namely securities and choses in action, then slowly assuming a definite legal status under English law, were found unprotected by this and the preceding statute. A statute, 52 George III. chapter 64, was therefore passed in 1812 to extend the law, to embrace bonds, bills of exchange, bank notes, all securities and orders for the payment of money, or the transfer of goods, or any valuable thing whatsoever. In 1827, on account of the subtle distinctions between larceny and fraud, under the law then existing, it was found necessary to pass another act, viz., 7 and 8 George IV., chapter 29, section 52, re-defining the offense, and providing that there should be no acquittal, notwithstanding that the case actually proved against one on trial for obtaining property under false pretenses, amounted to the technical offense of larceny. Finally the entire English law on the subject was codified by the statute 24 and 25 Victoria, chapter 96, sections 88 and 89, enacted in 1861, which provides for, and punishes every species of obtaining money or property by false pretenses.

In the United States, statutes, following the English, and based principally on 30 George II., chapter 24, heretofore noticed, have been generally enacted in the individual states. The effect of the American statutes has been to embrace the numerous varieties of obtaining money or property by false pretenses, not covered by the common law. It may be stated as a general proposition, under these American statutes, that it is indictable to obtain money or goods from individuals by *any* designedly false statements of facts likely, under the particular circumstances of the case, to deceive (Wharton, Crim. Law). Among others, the following false pretenses, followed by actually obtaining money or goods, have been held indictable in American law—that the party was a person of wealth and credit; that he was the owner of specific assets; that he had funds in the hands of a third party; pretending to have supernatural powers; to have delivered goods or to have been sent therefor; false personation of other persons; fictitious legal claims. False pretenses must however, be distin-

FALSE RETURN—FALSE WEIGHTS.

guished from mere 'puffing' or an exaggerated praise. The latter is not indictable unless specific assertions, actually false, are knowingly made. Obtaining property by giving checks which are known to the party to be worthless is a criminal false pretense, and this also applies to spurious money. It is not necessary, that a party, to make himself criminally liable, shall make use of false words. The false pretense may be implied from his conduct, or even from his silence when acquiescing in another's statements. The false pretense is not required to come from the indicted personally; he may be criminally responsible, though the act were performed by an agent or confederate. It is, however, a fundamental rule, that the articles must have been obtained by means of the false pretense, though the latter is not required to be the sole motive for giving them up. To constitute the offense the *property* in the articles must be parted with by the party defrauded. If merely the *possession* be surrendered, the crime is not complete, though in such case a person may be guilty of larceny, if having obtained possession he subsequently takes the property.

FALSE RETURN', ACTION FOR: remedy against a false return made by a sheriff to a writ. When a sheriff makes a false return to a writ, the party injured may maintain an action against him for damages. Thus, a return of *non est inventus* to a writ of *capias*, when the defendant might have been apprehended, or a return of *nulla bona* to a *fiery facias*, when there were goods which might have been seized, renders the sheriff liable in damages to the amount of loss occasioned by his negligence.

FALSE SIGNALS: any false light or signal exhibited with intent to bring any ship or vessel into danger. The act is made felony, and the felonious intent may be proved by declarations made by the accused, or by circumstances which fairly lead to the conclusion of a guilty purpose.

FALSE SWEARING: see PERJURY.

FALSETTO, n. *fäl-wäl-sët'tō*, also FALSET [It.]: in *singing*, a strain on the voice above its natural compass; a feigned or false voice. The term is applied to the highest register of a man's voice, which joins the natural or chest voice, and which by practice may be so blended with the chest-voice as to make no perceivable break.

FALSE VERDICT: verdict by a jury against the evidence. The remedy in cases where it was alleged that a false verdict had been returned, was formerly in England by means of a writ of attain; but this only in cases where the jury had returned a verdict on their own knowledge of the facts, and the writ proceeded on the assumption that, in returning a false verdict, they were necessarily perjured. Writ of attain was abolished under George IV.—The universal rule now is, that though in most civil cases a new trial may be had for various causes, in no case can jurymen be punished, though finding a verdict against evidence.

FALSE WEIGHTS AND MEASURES: fraudulent devices in trade, whose use is an offense at common law.

FALSI CRIMEN—FALUN.

FALSI CRIMEN, phrase, *fāl'sī krī'měn* [L. the crime or charge of what is false or fraudulent]: in *law*, fraudulent subornation or concealment, allied to forgery.

FALSIFY, FALSIFICATION, etc.: see under **FALSE**.

FAL'SIFYING REC'ORDS: obliterating, injuring, or destroying any record, writ, etc., or any original document belonging to any court of justice. It is a serious crime severely punishable, as is the crime also of any person employed to furnish certified copies wilfully certifying any document as a true copy, knowing the same is not so. Similar is the crime of any person employed in a public record office certifying any writing to be a true copy, knowing the same to be false in any material part.

FALSTER, *fāl'stér*: Danish island in the Baltic, s. of Seeland, lat. 54° 30'—54° 58' n., and long. 11° 45'—12° 11' e. It is separated by the strait called the Grönsund from the island of Moen, and by that called the Guldborgsund from the island of Laaland, together with which F. forms the stift or province of Laaland, a province with 635 sq. m., and about 200,000 inhabitants. F. is about 26 m. long, and 16 wide at its widest part, and has about 178 sq. m. It is flat, remarkably fruitful, and well cultivated, so that it resembles an attractive garden. The inhabitants are employed chiefly in agriculture and cattle-breeding. The chief town is Nykjöbing, on the Guldborgsund. It is very old, has a castle and a cathedral, has some commerce and ship-building, and a pop. about 4,000. The only other place of any note is Stubbekjöbing.—Pop. of the island of F., abt. 28,000.

FALTER, v. *faul'tér* [OF. *falter*, to fail: Norw. *haltra*, to limp: Sp. *faltar*, to fail, to falter—connected with **FAULT**: comp. Gael. *fealltair*, a perfidious person]: to hesitate in speaking; to speak with broken or trembling tones; to be unsteady or feeble; to hesitate in purpose. **FAL'TERING**, imp.: **ADJ.** hesitating. **FAL'TERED**, pp. *-térđ*. **FAL'TERINGLY**, ad. *-tér-ing-lī*.

FALTER, v. *faul'tér* [Gael. *falt*, the hair of the head': in *OE.*, to thrash barley in the chaff; to cleanse barley. **FALTERED**, pp. *faul'térđ*, having hair disordered; dishevelled.

FALUN, or **FAHLUN**, *fál'lón* (called also *Gamla Kopparberget*, 'old copper-mine'): town of Sweden, cap. of the län, or province, of the same name. It has long been famous for its copper-mines, though the quantity of ore now obtained is much smaller than formerly. In 1650, the yield was 3,000 tons annually; this declined, in 1690, to 1,900 tons; while at present it is only about 400 tons. Gustavus Adolphus called the mines the 'treasury of Sweden.' The excavations extend for miles underground, containing vast chambers, where Bernadotte, the late king, gave splendid banquets, on which occasions the mines were brilliantly lighted. F. is regularly built, and its houses are of wood, and blackened by the fumes of the numerous smelting-furnaces. Pop. (1891) 8,085.

FALUNS—FAMAGOSTA.

FALUNS, *fá'lúnz*: term given by the agriculturists of Touraine to shelly sand and marl, which they use as manure. The term is applied by geologists to the formations from which they are obtained. They are loosely aggregated beds of sand and marl, but occasionally so compacted by calcareous cement as to form a soft building-stone. The animal remains in them are chiefly marine, and of a more tropical fauna than that of the Mediterranean. A few land and fluviatile mollusca are found mixed with the oceanic forms, and with these are associated the remains of terrestrial quadrupeds, as *Dinotherium* (q.v.), *Mastodon* (q.v.), *Rhinoceros* (q.v.), etc.

FALX, n. *fálks* [L. a sickle, a scythe]: in *anat.*, anything shaped like a sickle or scythe.

FAMA, *fá'ma* [Gr. *Pheme*]: in *classical myth.*, the goddess of rumor. She appears in the works of the earliest poets. Sophocles makes her the child of Hope; Virgil, the youngest daughter of Terra, the sister of Enceladus and Cæus.

FAMA CLAMOSA, *fá'ma kla-mó'sa*, in the Ecclesiastical Law of Scotland: wide-spread report, imputing immoral conduct to a clergyman, probationer, or elder of the church. A F. C., if very clamant, may form the ground of process by a presbytery, without any specific complaint being brought before them, or there being any particular accuser. In these circumstances, the presbytery act for the vindication of their own order, and in behalf of the morals of the community. Should the inquiries of the presbytery lead them to the conviction that the rumor is not without foundation, they will serve the accused party with a libel, and thus bring him for trial before them. (Hill's *Church Prac.* 49; Cook's *Styles*; and Wood *On Libels*).

FAMAGOSTA, *fá-má-gós'tá*, or **FAMAGUSTA**, *fá-má-gós'tá*: seaport on the e. coast of Cyprus (q.v.); on the supposed site of ancient Arsinoë, about 35 m. from Lefkosia (q.v.). present cap. of the island. It was a place of importance in the crusades, and under the Venetians 1489—1571 it became rich and flourishing, with a pop. of fully 30,000 inhabitants; now only a few hundreds find shelter among the filthy ruins, the wreck of its churches and palaces. On coming under the sway of the Turks after a siege of four months, it fell into a state of decay; an earthquake 1735 completed its ruin. The town is inclosed within well-built walls, constructed from the ruins of Salamis; but of its 300 churches, only one, that of St. Nicolas, remains. It is now used as a mosque, but contains many monuments of its former use, and is a fine specimen of mediæval architecture; in it Richard I. of England crowned Guy de Lusignan king of Cyprus, 1191. F. possesses a good natural harbor, about 8,000 ft. long, by 2,000 ft. wide, which would require to be dredged before it could admit ships of the largest tonnage. The water in the bay exceeds 170 fathoms in depth. Under Turkish rule F. was simply regarded as merely a military fortress and occupied by the sultan's troops; since Cyprus became a British possession, the affairs

FAME—FAMILIAR SPIRITS.

of the town and province have been administered by a resident civil commissioner and his assistant, with numerous native officials. About five m. n. are the ruins of ancient Salamis. Chief exports of F. are corn and pomegranates, for which the district is famous.

FAME, n. *fām* [F. *fame*—from L. *fāma*, rumor, fame; Gr. *phēmē*; It. *fama*, rumor, fame; comp. Gael. *fuaīm*, sound, noise]: renown; rumor; public report, good or bad. **FAMED**, a. *fāmd*, renowned; much talked of. **FAMELESS**, a. without renown. **FAMOUS**, a. *fā'mūs*, much talked of and praised; renowned. **FAMOUSLY**, ad. *-lī*, with great renown; in a manner highly gratifying, as, he is getting on *famously*. **FAMOUSNESS**, n. great fame; celebrity.—**SYN.** of 'fame': reputation; repute; notoriety; credit; honor;—of 'famous': celebrated; remarkable; noted; signal; conspicuous; illustrious; eminent; transcendent; distinguished; excellent.

FAMILIAR, a. *fā-mīl'yēr* [F. *famille*, a family—from L. *familia*, a family or household; It. *famiglia*; comp. Skr. *dhāman*, an abode, a house]: well acquainted with; well known; intimate; affable; easy and unconstrained; common; frequent: N. one long acquainted; a spirit or demon supposed to wait on; an officer or servant of the Inquisition (q.v.) employed to arrest and imprison the accused. **FAMILIARLY**, ad. *-lī*. **FAMILIARITY**, n. *-ī-ār'ī-tī* [F. *familiarité*]: freedom from ceremony; affability; intimacy; fellowship. **FAMILIARIZE**, v. *-yēr-īz*, to make intimate or familiar; to make easy by practice or by intercourse. **FAMILIARIZING**, imp. **FAMILIARIZED**, pp. *-īzd*. **FAMILY**, n. *fām'ī-lī*, a household; descendants from one common progenitor; race; lineage; in *nat. hist. classifications*, the group next in comprehensiveness above a *genus* (see **ORDER**, in Natural History); kind, tribe, or group. **FAMILY OF LOVE**: see **AGAPEMONE**.

FAMILIAR SPIRITS: supernatural beings, spirit slaves, deemed to be in attendance upon magicians, wizards, witches, conjurors, and other skilful professors of the black art. The word 'familiar' is in all likelihood derived from the Latin *famulus* (a 'domestic,' a 'slave'). The belief in such spirits goes far back into the history of the race. We read of them in the time of Moses, who admonishes his countrymen.—'Turn ye not unto them that have familiar spirits' (Lev. xix. 31), which would imply the prevalence of the belief among the Jews and Egyptians. The word in the original rendered 'familiar spirits' is *oboth*; it is of frequent occurrence in the Hebrew Scriptures, and literally signifies 'leathern bottles;' thereby indicating the antiquity of the idea, that magicians were wont to imprison in bottles the spirits whom their spells had subdued (whence our 'bottle-imps' and 'bottle-conjurors'); cognate with which grotesque belief is perhaps the fact that mystical liquids kept in vials have been immensely in vogue among conjurors of all ages and countries. It is not clear, as some think, that we can include Socrates among those who deemed themselves to have a familiar

FAMILIAR SPIRITS.

spirit; for though he spoke of his attendant 'dæmon' in ambiguous terms, the opinion of all enlightened critics is, that he meant by the word that which Christians mean by the presence of a divine light and guide in the heart and conscience. But according to Delrio—a great authority on this subject—the belief in familiar spirits in the grosser and more magical form did exist among the ancient Greeks; who, he affirms, designated such beings *Paredrii*, 'companions,' as being ever assiduously at hand. The story of the ring of Gyges, king of Lydia, narrated by Herodotus, is held by Heywood (see *Hierarchy of the Blessed Angels*, etc.) to prove the existence of the belief in that country also; and it is quite certain that during the middle ages the belief in 'enchanted rings' containing familiar spirits was widely diffused throughout Europe, the magicians of Salamanca, of Toledo, and of Italy, being especially famous for their skill in thus subjugating and imprisoning demons. Asia seems the original home of this belief, which has long been established as a cardinal superstition of the Persians and Hindus, and which appears in perfection in the *Arabian Nights*. The 'slave of the lamp' who waits upon Aladdin is an example in point. Whether the belief in spirit slaves sprang up independently among the nations of w. Europe, or was transplanted thither by intercourse with the East, is not known. A favorite form assumed by the familiar spirit was that of a black dog. Jovius and others relate, that the famous Cornelius Agrippa (q.v.), half philosopher, half quack, was always accompanied by 'a devil in the shape of a black dog;' and add, that when he perceived the approach of death, he took a collar ornamented with nails, disposed in magical inscriptions, from the neck of this animal, and dismissed him with these memorable words: *Abi, perdita Bestia, que me totum perdidisti*—('Away, accursed beast, who has ruined me wholly for ever'). Butler, in his *Hudibras*, speaks highly of this animal:

Agrippa kept a Stygian pug
 P' the garb and habit of a dog
 That was his tutor, and the cur
 Read to the occult philosopher,
 And taught him subtly to maintain
 All other sciences are vain.

The readers of Goethe, too, will remember that Mephistopheles appears first in this shape to Faust and Wagner during their evening walk; but, in truth, the earliest instances of such transmigration are much older at least, if mediæval tradition can be credited, for it assures us that Simon Magus and other ancient magicians had familiar spirits who attended them in the form of dogs. In spite of the servitude to which the attendant imps were reduced by the potent spells of the magicians, they were popularly supposed, during the middle ages, to have their revenge at last, by carrying with them into eternal torment the souls of their deceased masters. This idea of divine retribution overtaking the practitioners of magic is, however, not found outside of Christendom. The Jews think not the less but the more of Solomon because he was, as they say, one of the greatest

FAMILIST—FAMILY.

of magicians; and a similar feeling in regard to 'wonder-workers' pervades eastern nations generally, though it is to be noticed that the latter are often represented as using their power malignantly: see MAGIC. Modern spiritism in some of its phases shows the tenacity of this belief in the human mind, without which it could have no basis for its amazing structures of fraud; see SPIRITISM.

FAMILIST, n. *făm'î-lîst* [L. *familia*; Eng. -*ist*]: in *chh. hist.*, a sect which arose in Holland about the middle of the sixteenth c., and taught that the essence of religion consisted in the feelings of divine love, hence they were otherwise called the Family of Love, though entirely distinct from the Agapemone (q.v.). Some familists were fanatical perfectionists; others were grossly immoral.

FAMILY: household; having at least its usual nucleus, though not usually its limits, in a common lineage. Though we are in the habit, doubtless with reason, of regarding the life of antiquity, and particularly of Greece, as less domestic than that of Christian Europe, the idea of the family or house [Gr. *oîkós*], as the nucleus of society, as the political unit, was there very early developed. Aristotle speaks of it as the foundation of the state, and quotes Hesiod to the effect that the original family consisted of the wife and the laboring ox, which held, as he says, to the poor the position of the slave (*Polit.* i. 1). The complete Greek family then consisted of the men and his wife and his slave; the two latter, Aristotle says, never having been confounded in the same class by the Greeks, as by the barbarians (*Ib.*). In this form, the family was recognized as the model of the monarchy, the earliest, as well as simplest, form of government. When, by the birth and growth of children, and the death of the father, the original family is broken up into several, the heads of which stand to each other in a co-ordinate rather than a strictly subordinate position, we have in these the prototypes of the more advanced forms of government. Each brother by becoming the head of a separate family, becomes a member of an aristocracy, or the embodiment of a portion of the sovereign power, as it exists in the separate elements of which a constitutional or a democratic government is composed.

But at Rome the idea of the family was still more closely entwined with that of life in the state, and the natural power of the father was taken as the basis not only of the whole political, but of the whole social organization of the people. For the Roman idea of the family in its more special aspects: see PATRIA POTESTAS. Here it suffices to state that with the Romans, as with the Greeks, it included the slave as well as the wife, and ultimately the children; a fact which indeed is indicated by the etymology of the word, which belongs to the same root as *famulus*, a slave. In its widest sense, the *familia* included even the inanimate possessions of the citizen, who, as the head of a house, was his own master (*sui juris*); and Gaius (ii. 102) uses it as synonymous with *patrimonium*. In general, however, it was confined to persons—the wife, children,

FAMILY.

grandchildren, and great-grandchildren, if such there were, and slaves of a full-blown Roman citizen. Sometimes, too, it signified all those who had sprang from a common stock, and would have been members of the family, and under the potestas of a common ancestor, had he been alive: see AGNATE. In this sense, of course, the slaves belonging to the different members of the family were not included in it. It was a family, in short, in the sense in which we speak of 'the royal family,' etc., with this difference, that it was possible for an individual to quit it, and to pass into another by adoption: see ADOPTION. Sometimes, again, the word was used with reference to slaves exclusively, and, analogically, to a sect of philosophers, or a body of gladiators. See Smith's *Dictionary of Greek and Roman Antiquities*.

The whole social fabric is based on the grouping of human beings in families; an arrangement in harmony with all the conditions and wants of human life, and which tends to foster habits and affections essential to the welfare of mankind. A prosperous community must be an aggregate of happy families; there being little true happiness in the world that is not intimately connected with domestic life. The formal bond of the family is marriage (q. v.; see also POLYGAMY); and an essential condition of its right development seems to be a distinct abode, which shall be not a mere shelter, but a house or *home*, affording a certain measure of comfort and decency, according to the standard prevalent in the community. According to the views of some modern anthropologists, the family is historically posterior and not prior to the tribe. See MARRIAGE, and the books there named.

FAMINE.

FAMINE, n. *făm'in* [F. *famine*—from mid. L. *famīnā*—from L. *fāmēs*, hunger: It. *fame*; F. *faim*, hunger: comp. Gael. *feum*, to be in want]: scarcity of food; want; destitution. **FAM'ISH**, v. *-ish*, to starve; to suffer from want. **FAM'ISHING**, imp.: **ADJ.** starving; perishing for want of food. **FAM'ISHED**, pp. *-isht*. **FAM'ISHMENT**, n. state of extreme want. **FAMINE-FEVER**, n. in *med.*, typhus fever; relapsing fever.

FAMINE: in general a period of suffering produced by scarcity of food. Famines have occurred in all parts of the world and from remote ages. Extended lists have been made of the most distressing ones with more or less particularity of detail, and scientists have presented thoughtful speculations upon their causes. Among the avoidable causes are enumerated war, defective agriculture, deficient transportation, legislative interference, currency restrictions, speculation in food products, and misapplication of grain; and among natural causes are excessive rain, frost, drought, earthquakes, hurricanes, hail-storms, and plagues of vermin, insects, worms, rats, and rabbits. How many human beings perished in the famines of which some records have been preserved cannot be computed, but the number must have extended into hundreds of millions, since it is known that those in India alone have carried off more than 30,000,000 within little more than a century. The increase of railroads and other means of intercommunication has not lessened the occurrence of famines to the extent anticipated, though it has had the effect of immeasurably ameliorating the suffering in stricken localities by hastening the means of relief. As far back as B.C. 1708 Egypt was visited by a 7 years' F., during which millions of people and animals perished. In B.C. 436 thousands of people threw themselves into the Tiber at Rome to escape terrors of starvation, and other thousands starved outright. Egypt again suffered A.D. 42, and Rome 262, when the horrors of a plague were added to the affliction of a F. In 272 Great Britain was visited by such a severe F., that the people were forced to eat the bark of trees; in 306 both F. and plague spread over Scotland, carrying off thousands; 4 years later, England lost 40,000 people from the same causes; and in 325 all of Great Britain suffered from a F. Phrygia experienced its terrors 370, Constantinople 446, and Italy, where parents were reduced to the awful extremity of eating their own children, 450. Scotland had another visitation 576, and the British isles then had a respite till 739, when England, Wales, and Scotland were plunged into a common distress, which was repeated 823 and 954-9, while England was an isolated sufferer 974, 976, 1005. Since 1000, India has suffered most from F., and Great Britain next. It will be interesting to note the years of the most severe visitations in the former country, as they cover much of the period of modern administration, refute the old claim that the opening of railroads and post roads would decrease the occurrence of F., and show that these ameliorating agencies are powerless against the natural causes already enumerated. In 1771 Bengal was devastated; 1837

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-8 over 800,000 perished in the N. W. Provinces: 1860-1 the same region suffered nearly as severely; 1865-6 about 1,000,000 died in Bengal and Orissa; 1868-9 about 1,500,000 in Rajpootana and vicinity; 1874 a F. occasioned by drought carried off thousands more in Bengal; 1877 about 500,000 died in Bombay, Madras, Mysore, and adjoining agencies, and the govt. determined to lay aside \$7,500,000 annually for provision against future famines, the same to be known as the F. insurance fund and to be used in construction of protective works such as railroads and canals, 1880. Subsequent to 1005 England suffered in the general F. that scourged nearly the whole of Europe 1016. and in 1087, 1193-95 (when a pestilential fever accompanied it), 1251, 1315 (when the people were forced to eat even the most loathsome animals), 1335 (caused by long rain), 1353, 1748 (through the whole realm), 1795 and 1801 (also through the realm). Ireland suffered independently, chiefly in consequence of the failure of the potato crop, 1814, 16, 22, 31, 46, 47, and 80. At the last period the U. S. govt. sent a war vessel thither with food, of which James Gordon Bennett, Levi P. Morton, and William R. Grace contributed each a fourth part of the entire cargo. France shared with England the distress of 1193-95, 1353, and was isolated 1693, 1789. The n. provinces of China were devastated 1876-79; Brazil had its first serious F. 1878; Egypt was visited 1879; Persia lost many thousands 1871-72, 1880; Cape Verde, Africa, lost 16,000, 1775; Iceland had a F. caused by the unusually severe polar winter, 1881-2, which rendered agriculture impossible in most parts, and the distress of the people was aggravated by epidemics of small-pox and measles; the w. Highlands of Scotland, the Hebrides Islands, and the coast of Ross-shire suffered extreme destitution from the entire failure of the potato crop and herring-fishery and the destruction of the grain crops by hurricanes 1882; Upper Silesia experienced its greatest destitution from an overflow of the Oder river 1880; suffering from scarcity of food and freezing of winter wheat prevailed in many parts of European Turkey and especially in Armenia through 1880, and led to wide-spread rioting; and a severe drought produced a F. in Anatolia and the vilayets of Broussa, Angora, Konieh, Adana, Smyrna, and Sevas, Asia Minor, in the summer of 1887.

FAMINE, *fām'in*, **PORT**: abortive settlement of Spain, on the n. side of the Strait of Magellan, lat. 53° 38' S., and long. 70° 58' W. It owes its name to the death, by starvation, of the Spanish garrison; and it is said to be now a penal colony of the republic of Chili. Some voyagers, however, have spoken of the neighborhood as 'covered with flowers,' and 'decorated with luxuriance,' and capable of being made, so far as soil is concerned, 'one of the finest regions in the world.'

FAMOUS: see under **FAME**. **FAMOUSSED**, a. *fā'mūs-ēd*, less correctly *fā'mūst*, in *OE.*, rendered famous; renowned.

FAMULUS, n. *fām'ū-lūs* [*L. famŭlŭs*, a servant, an attendant]: the familiar spirit of a magician; any doer of hard or dirty work under a superior.

FAN.

FAN, n. *fän* [Ger. *wanne*; L. *vannus*, a winnowing fan; Gael. *fannan*, a gentle breeze]: a light broad frame used to cool the face by agitating the air with it; anything in the shape of a fan; an instrument for producing artificial currents of air by the revolving of two or more broad blades, used for winnowing grain (see **FANNERS**): **V.** to cool and refresh by moving the air; to winnow, as grain; to increase the heat or flame of, as by fanners. **FAN'NING**, imp. **FANNED**, pp. *fänd*. **FAN'NER**, n. he or that which fans. **FAN'NERS**, n. plu. the blowers of a winnowing machine or furnace (see below). **FAN-CORAL**, n. in *zool.*, name of the genus *Rhipidogorgia*, belonging to the family *Gorgonidæ*. **FAN-CRICKET**: see **MOLE-CRICKET**. **FAN-FOOT**, n. in *entom.*, a name given to the genus of moths *Polypogon*; in *zool.*, *Ptyodactylus Gecko*, species of lizard, a native of northern Africa, reputed to be exceedingly venomous. The toes form at the extremities round disks (whence the name *Fan-foot*), enabling the animal to climb up walls; the claws are retractile. The venom is said not to be injected by the teeth, but to be exuded from the lobules of the toes, whence the scientific name *Ptyodactylus*, from Gr. *ptuo*, to split, and *daktulos*, a finger or toe. **FAN-LIGHT**, a fan-shaped window, generally over a door. **FAN-TRACERY**, *-trä sër-ì*, carved work in Gothic architecture diverging like the folds of a fan. **FAN-TAIL**, tail of a bird capable of being spread out like a fan; a kind of pigeon. **FAN-TAIL WARBLER**, n. in *ornith.*, *Cisticola cursitans*, a very tiny bird, somewhat like a diminutive lark; native of southern Europe, Africa, India, and China. It is remarkable for its very neat and beautiful nest.

FAN: instrument for moving the air for the sake of coolness, or for winnowing chaff from grain. In the East, the use of fans for personal comfort is of remote antiquity. The Hebrews, Egyptians, Chinese, and the miscellaneous population of India, all used fans as far back as history reaches. At the present day, it is customary, in the better classes of houses in India, to suspend a large of fan from the ceiling, and keep it in agitation with strings, pulled by servants, in order to give a degree of coolness to the air: see **PUNKAH**. Among the oldest notices of winnowing fans are those in the Scriptures. There the fan is always spoken of as an instrument for driving away chaff or for cleansing in a metaphorical sense; and such notices remind us of the simple processes of husbandry employed by a people little advanced in the arts. It was a long stride from the use of a simple hand-instrument for winnowing to that of the modern mechanism employed for a similar purpose: see **FANNERS: BLOWING MACHINES**.

As is observable from the collection of Egyptian antiquities in the British Museum, the fan is a very ancient article of female taste and luxury. Terence, writer of Latin comedies, B.C. 2d c., makes one of his characters speak of the fan as used by ladies in ancient Rome: *Cape hoc flabellum, et ventulum huic facito*—‘Take this fan, and give her thus a little air.’ From this Roman origin, the fashion of carrying fans could scarcely fail to be handed

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down to the ladies of Italy, Spain, and France, whence it was in advanced times brought into Great Britain. Queen Elizabeth, when in full dress, carried a fan. Shakspeare speaks of fans as connected with a lady's 'bravery' or finery :

With scarfs and fans, and double charge of bravery.

In these and later times the fan was not a mere article of finery. There were walking as well as dress fans. The walking or outdoor fan which a lady carried with her to church, or to public promenades, was of large dimensions, sufficient to screen the face from the sun, and answered the purpose of the modern parasol (q.v.). In old prints, ladies are seen carrying these fans in different attitudes. The dress fan, which formed part of a lady's equipment at court ceremonies, drums, routs, and theatrical entertainments, was of a size considerably less than the walking fan, and altogether more elegant. Of these dress fans there remain numerous specimens bequeathed as heirlooms from one generation to another. All were probably of French manufacture. The more costly fan imported from China was and still is altogether of ivory, highly carved and pierced; but it lacks the lightness and flexibility essential in this article, which was used less for cooling than for giving the hands something to do, and for symbolically expressing certain passing feelings. In the hand of an adept, the fan, by peculiar movements, could be made to express love, disdain, modesty, hope, anger, and other emotions. Gay, speaking of Flavia's accomplishments, says :

In other hands, the fan would prove
An engine of small force in love.

Considering the coarseness of language, even in the higher circles, in the early part of the 18th c., we cannot wonder that the fan should have been indispensable to a lady in company. It was held up to shield the countenance when anything shocking was uttered. Pope has an allusion to this use of the fan—

The modest fan was lifted up no more,
And virgins smiled at what they blushed before.

Steele in a paper in the *Tatler*, No. 52, 1709, Aug. 9, gives an amusing account of Delamira, a fine lady, resigning her fan when she was about to be married. One of her female acquaintances, having envied the manner in which this charming and fortunate coquette had played her fan, asks her for it. Delamira acknowledges the wonderful virtues of the fan, and tells her that 'all she had above the rest of her sex and contemporary beauties was wholly owing to a fan (that was left her by her mother, and had been long in the family), which, whoever had in possession, and used with skill, should command the hearts of all her beholders; "and since," said she smiling, "I have no more to do with extending my conquests or triumphs, I will make you a present of this inestimable rarity."' Two years later, Addison, in a paper in the *Spectator* (No. 102), gives a humorous account of the tactics of coquettes in the use of fans, 'Women are armed with fans as men with swords,

FANAL—FANARIOTS.

and sometimes do more execution with them:’ then he goes on to describe how ladies are instructed to handle, discharge, ground, and flutter their fans—the whole being a pleasant satire on the fan-maneuvering in the reign of Queen Anne.

Later, in the 18th c., fans served another important purpose. At dancing assemblies in London, Bath, and elsewhere, it was usual for the gentlemen to select their partners by drawing a fan. All the ladies’ fans being placed promiscuously in a hat, each gentleman drew one, and the lady to whom it belonged was his allotted partner. Mrs. Montagu, in one of her letters, refers to this custom: ‘In the afternoon, I went to Lord Oxford’s ball at Mary-le-bone. It was very agreeable. The partners were chosen by their fans, but with a little *supercherie*.’ Of the trick or fraud which this authoress delicately veils under a French term, the beaux of that period were far from guiltless. A lady’s fan was almost as well known as her face, and it was not difficult, with a little connivance, to know which to draw. At Edinburgh, where it appears to have been the practice to select a partner for a whole season, the fans of the ladies were carefully studied. Sir Alexander Boswell alludes to this species of stratagem in one of his poems:

Each lady’s fan a chosen Damon bore,
With care selected many a day before;
For unprovided with a favorite beau,
The nymph, chagrined, the ball must needs forego.

In Spain, the old fashion of fan-flirting appears to be still in vogue. A traveller in that country says: ‘I was vastly interested in the movements of the ladies’ fans at church. All the world knows that Spanish fans are in perpetual motion, and betray each feeling, real or assumed, that passes through the mind of the bearer.’—*Vacation Tourists*, 1861. See *The Fan* by Uzanne (transl. 1883).

FANAL, n. *fa-nal* [F.—from Gr. *phaino*, lamp—from *phaino*, I show, I shine forth]: a light-house; or, more correctly speaking: the apparatus in the light-house for giving light.

FANAM, n. *fān am*: money of account formerly used in Madras; value about 3½ cents; copper coin of Ceylon worth about 3 cents.

FANARIOTS, *fān-ār-i-ots*: general name given to the Greeks inhabiting the Fanar or Fanal in Constantinople, a quarter of the city which takes its name from the beacon (Gr. *pharos*) in it. They first appear in history after the taking of Constantinople by the Turks, and appear to have been originally descendants of such noble Byzantine families as escaped the fury of the barbarians. Afterward, however, the class was recruited by emigrants from different parts of the old Byzantine empire. Subtle, insinuating, intriguing, they soon took advantage of the ignorance of the Turkish governors, and made themselves politically indispensable to their rulers. They filled the offices of dragomans, secretaries, bankers, etc. One of them, named Panayotaki, at a later period, was appointed Dragoman to

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the Divan, and his successors obtained still greater honors. Through their influence, the lucrative office of Dragoman of the Fleet was called into existence, which gave them almost unlimited power in the islands of the Archipelago. Besides, from them were chosen, until the outbreak of the revolution 1822, the Hospodars of Wallachia and Moldavia, while, in addition, the disposal of most of the civil and military posts under the Turkish govt. was in their hands. In spite of their power, however, the F. never showed much patriotism; they were animated by the petty motives of a caste, and when the war of liberation broke out among their countrymen, they took no part in it. In the present altered state of affairs in Turkey, they have no political influence. See Marco Zalloni's *Essai sur les Fanariots* (Marseille, 1824; 2d ed. 1830); also Finlay's *History of the Greek Revolution* (Edin., Blackwood and Sons 1861).

FANATIC, a. *fā-năt'ik*, or **FANATICAL**, a. *-i-kāl* [*F. fanatique*, fanatic—from L. *fanaticus*, inspired by a divinity, frantic—from *fānūm*, a temple: It. *fanatico*]: extravagant and excessive in opinions, generally religious opinions; N. a person possessed of mild notions or opinions; an enthusiast. **FANATICALLY**, ad. *-lī*. **FANATICISM**, n. *-sizm*, wild and extravagant notions in religious subjects.—**SYN.** of 'fanatic, n.': visionary; zealot; bigot;—of 'fanaticism': enthusiasm; frenzy; superstition.

FANCY, n. *fān'sī* [*F. fantasie*, the fancy—from mid. L. *fantāsiā*—from Gr. *phantasiā*, a making visible, imagination—from *phainō*, I appear]: an image or representation formed in the mind at pleasure, but not always connected with reason or practicability; a notion; a liking; a conceit or whim (see **IMAGINATION**): **ADJ.** elegant; ornamental: **V.** to figure to one's self; to imagine; to like; to be pleased with. **FANCYING**, imp. **FAN'CIED**, pp. *-sīd*: **ADJ.** imagined; imaginary; liked. **FAN'CIER**, n. *-sī-ēr*, one who fancies or has a strong liking for, as a *dog-fancier*. **FAN'CIFUL**, a. *-fāl*, guided by the imagination rather than by reason or experience; full of wild images; visionary; whimsical. **FAN'CIFULLY**, ad. *-lī*. **FAN'CIFULNESS**, n. **THE FANCY** [a slang term]: the whole body of sporting characters, generally applied to the prize-ring. **FANCY-BALL**, one at which fancy dresses, in various characters, are worn. **FANCY-FREE**, free from the power of love. **FANCY MONGER** [see **MONGER**]: in *OE.*, one given to wild conceits and whims through love. **FANCY-SICK**, one with an unsound or disordered mind.—**SYN.** of 'fancy, n.': conceit; imagination; humor; taste, inclination; conception; caprice; impression;—of 'fanciful': ideal; capricious; imaginative; fantastic; wild; chimerical.

FANDANGO, n. *fān-dān'gō* [Sp.]: like the *Bolero*, an old Spanish national dance, in $\frac{3}{4}$ time. It is danced most gracefully in the country districts, usually to the accompaniment of a guitar, while the dancers beat time with castanets, a custom borrowed from the Moors. It proceeds gradually from a slow and uniform to the liveliest motion; and notwithstanding the simplicity of the *pas*, vividly ex-

FANE—FANG.

presses all the graduations of the passion of love, in a manner sometimes bordering on licentiousness. The people are so passionately fond of it, that the efforts of the clergy have never been able to suppress it.

FANE, n. *fän* [L. *fānum*, a temple—from *fārī*, to speak, to utter in prophecy]: a church; a temple.

FANE, n. *fän* [Icel. *fáni*, a flag: Gael. *fannan*, a gentle breeze: L. *vannus*; Ger. *wanne*, a winnowing-fan: Ger. *wannen*, to winnow; *fahne*, a vane]: in *old* and *prov. Eng.*, anything on an elevation free to be moved by the wind like a flag, to show which way the wind blew; a weathercock—formerly made in various shapes, but seldom that of a cock; in *OE.*, a banner. *Note.*—VANE is the word now used for FANE.

FANEUIL HALL, *fän'el*, popularly, *fün'el*: spacious public hall in Boston, erected 1742 by Peter Faneuil, and presented by him to the town. Peter Faneuil (1700–43) was of French-Huguenot descent; b. New York, and removed to Boston, where he amassed wealth in mercantile life. In its original condition, the building when completed and presented, contained a hall for public meetings, with smaller apartments above, and a basement used as a market. In 1761, it was destroyed by fire, and rebuilt. During the revolutionary struggle with England, the hall was so often used for important political meetings, that it became known as 'the cradle of American liberty.' In 1805, the building was increased in height by an additional story, and also increased in width. It is now about 80 ft. square. The hall contains some fine paintings; and the basement is no longer used as a market.

FANFARE, n. *fän'fär* [F. *fanfare*, the sound of a trumpet: Gael. *fonn-fair*, the music of awakening, the reveille—from *fonn*, music, a tune; *fair*, the break of day]: a flourish of trumpets; short and lively military air or call, executed on brass instruments. It was brought by the Arabs into Spain, whence it passed into Mexico and the new world. FANFARON, n. *fän'fä-rön* [F.]: one who blows the trumpet of his own praises; a bully; a swaggerer; a boaster who 'blows his own trumpet.' FANFAR'ONADE, n. *-näd'*, blustering talk; swaggering; empty noise.

FANG, n. *fäng* [AS. *fang*, a taking, a grasp: Ger. *fangen*, to catch: Dut. *vangen*; Goth. *fahan*, to catch]: a pointed tooth; a tusk; a claw or talon; in *OE.*, a sheriff's officer: V. in *OE.*, to seize with fangs; to clutch. FANGED, a. *fängd*, having fangs. FANG'LESS, a. having no fangs. INTO HIS FANGS, into his clutches or power. TAKEN WITH THE FANG, in *Scottish laro*, a thief apprehended while carrying the stolen goods on his person. It is not very long since this word formed part of the common speech of Scotland:

*Snap went the shears, then in a wink,
The fang was stowed behind a blink.'

Morison's Poems, p. 110.

In England, also, the verb *fang* was still in use in Shakespeare's time: 'Destruction *fang* mankind!' (*Timon of*

FANGLED—FANNING.

Athens, iv. 3); and 'Master Fang,' in *Henry IV.*, is named after his office.

FANGLED, a. *fäng'glä* [AS. *ficol*, fickle; Ger. *ficken*, to move lightly to and fro: comp. Gael. *faoinealach*, silly, foolish]: begun; newly made. FANGLE, n. *fäng'gl*, a trifle; a vain thing; a newly-fashioned trifle. NEW-FAN'GLED, a. inconstant; changeable; given to novelty.

FANION, n. *fän'yün* [F.]: a small flag carried with the baggage of an army.

FANK, n. *fänk* [Scot.]: a sheep-cote or pen; a coil of rope: V. to put a sheep in a fold; to coil a rope. FANK'ING, imp. FANKED, pp. *fänkt*.

FANNERS, FANNING: see under FAN.

FAN'NERS [see FAN]: machine with blowers employed to winnow grain. In passing through the machine, the grain is rapidly agitated in a sieve, and falling through a strong current of wind, created by a rotatory fan, the chaff is blown out at one end, and the cleansed particles fall out at an orifice beneath. See BLOWING-MACHINE. The apparatus is chiefly of wood, and is moved by hand, or connected with the driving power of a thrashing mill or other engine. The fanners superseded the old and slow process of winnowing, which consisted in throwing up the grain by means of sieves or shovels while a current of wind, blowing across the thrashing floor, carried away the chaff. When the first machine was introduced into Britain, by a farmer in Scotland 1737, it met strong opposition, as interfering with the Divine prerogative which alone had power over the winds. But the advantages soon overcame the prejudice whose record Walter Scott has preserved in *Old Mortality*—making Mause Headrigg speak anachronously to her mistress about 'a newfangled machine for *dight-ing* the corn frae the chaff, thus impiously thwarting the will o' Divine Providence, by raising wind for your leddyship's use by human art, instead of soliciting it by prayer, or patiently waiting for whatever dispensation of wind Providence was pleased to send upon the shieling-hill.'

FANNING, *fän'ing*, DAVID: 1756–1825; b. Wake co., N. C.: tory marauder. He was a carpenter by trade, and espoused the British cause in the latter part of the revolutionary war, in revenge for having been robbed by men calling themselves whigs. He organized a band of desperadoes in Chatham and Randolph counties, hung a number of whigs, desolated their settlements, captured the town of Pittsborough while a court was in session and carried off all the judges, lawyers, and spectators, raided Hillsborough the capital and captured Gov. Burke and his entire staff, and took the American Col. Alston and a guard of 30 men from his own house. He was commissioned a col. of militia by the British; fled to Fla., and then to St. John, N. B. after the war; became a member of the provincial assembly, was sentenced to be hanged for fresh crimes, 1800, and escaped to Digby, N. S., where he lived quietly till death.

FANO—FANTASIA.

FANO, *fá nō* [Lat. *Fanum Fortunæ*, named from the temple of Fortune which the Romans erected here in commemoration of the defeat of Asdrubal on the Metaurus]: town and seaport of Italy, province of Urbino e Pesaro, finely situated in a beautiful and fertile district on the shore of the Adriatic, 30 m. n.w. of Ancona, near the mouth of the Metaurus. It is well built surrounded with walls and ditches, has a cathedral dedicated to St. Fortunato, and numerous churches containing many valuable paintings, among which are several of the best works of Domenichino, and an excellent 'Annunciation' by Guido. The remains of a triumphal arch of white marble, raised in honor of Augustus, are perhaps the chief object of classical interest. There is considerable trade in corn and oil, and in silk goods. Here, 1514, Pope Julius II. established the first printing-press with Arabic letters known in Europe. The port of F. was formerly well known to the traders of the Adriatic; its commerce, however, has declined, and the harbor is partly choked with sand.—Pop. 9,500.

FAN PALM: name common to all palms which have fan-shaped leaves, as the species of *Mauritia*, *Lodoicea* (Double Cocoa Nut), *Hyphene* (Doom Palm), *Corypha*, *Livistona*, *Chamærops*, etc. The only truly European palm, *Chamærops humilis* (q.v.), is a F. P., as is also the N. American Palmetto. The Talipot Palm (*Corypha umbraculifera*) is called sometimes the Great Fan Palm. The Palmyra Palm is another fan palm. The fan-shaped leaf is produced by an abbreviation of the midrib of a pinnated leaf.

FANS, THE: race of aborigines in Equatorial Africa, between the Gaboon and the Ogobai rivers, accurately described first by Du Chaillu. They are a fine capable race of savages, but are habitual cannibals.—The *Fantis* are a race of Negroes (q.v.) on the Gold Coast.

FANSHAWE, *fán'shaw*, SIR RICHARD: 1608–66: author and royalist partisan. He studied at Cambridge; and 1626, became a member of the Inner Temple. On the outbreak of the civil war, he took part with the king; and 1648, became treasurer to the navy under Prince Rupert. He was taken prisoner at the battle of Worcester; and on his release, withdrew to Breda in Holland, where Charles II. was holding his court in exile. After the Restoration, he was appointed ambassador at the court of Madrid, where he died. His most celebrated work, now very rare, is a translation of Guarini's *Pastor Fidor*, the lyrical passages of which are rendered with remarkable skill and elegance. The volume in which it appeared, 1664, contains other pieces in prose and verse.

FANTASIA, n. *fán-tá zhí-ǎ* [It.]: in *music*, a composition similar to the capriccio. The name is given also to extempore effusions performed by a musician with the rare gift of producing off-hand music like a well-studied composition. Hummel was more celebrated for his extempore fantasias on the pianoforte than even for his published compositions. Frederick Schneider was equally great in free fantasias on the organ.

FANTASTIC—FAN TRACERY VAULTING.

FANTASTIC, a. *făn-tăs'tîk*, or FANTAS'TICAL, a. *-tî-kăl* [*F. fantasque* and *fantastique*, fantastic—from mid. L. *fantasticus*, capricious, disorderly—from Gr. *phantasiā*, vision, fancy (see FANCY)|: imaginary; fanciful; unreal; full of absurd fancies; capricious. FANTAS'TICALLY, ad. *-lî*. FANTASY, n. *-tî-sî*, the original spelling of FANCY, which see.—SYN. of 'fanastic': see under FANCY.

FANTOCCI'NI: see PUPPET.

FAN-TRACERY VAULTING: in *architecture*, a kind of Late Gothic vaulting (15th c.), so called from its resemblance to a fan. The ribs or veins spring from one point, the cap of the shaft, and radiate with the same curvature, and at equal intervals, round the surface of a curved cone or polygon, till they reach the semicircular or polygonal ribs which divide the roof horizontally at the ridge level. The spaces between the ribs are filled with foils and cusps, resembling the tracery of a Gothic window; hence the name *fan-tracery*. The spaces between the outlines of the fans at the ridge level, are called by Prof. Whewell (*German Churches*) ridge lozenges. In Henry VII.'s Chapel, Westminster, one of the best examples of this kind



Fan-tracery :

From King's College Chapel, Cambridge.

of vaulting, these lozenges are occupied by pendants, which produce a most astonishing effect, seeming to be arches resting on nothing. They are, however, supported with great ingenuity by internal arches, rising high above the visible vaulting. This peculiar feature is one of the *tours de-force* which astonish the common crowd, but are adopted only when art has degenerated into artifice. Fan-tracery is a very beautiful kind of vaulting, and is peculiar to England, where it originated, and where alone it was practiced. Among the finest examples besides Henry VII.'s Chapel at Westminster, are St. George's, Windsor; and King's College Chapel, Cambridge. Fan-tracery is

FAP—FARADAY.

frequently used also in the vaulting of cloisters, as at Canterbury, Chester, etc.

FAP, a. *fäp* [Gael. *faob*, a protuberance]: in *OE.*, swollen with drink; dead-drunk.

FAR, a. *fär* [AS. *feor*; Goth. *fairra*, far: Icel. *fjarri*; Sw. *fjerran*, afar]: distant; remote; more distant; remoter of the two: AD. remotely; very much; in a great part, as 'the night is *far spent*'. FARNESS, n. remoteness. FARFAMED, widely celebrated. FAR-FETCHED, strained; forced; unnatural. BY FAR, very much. FAR OTHER, very different. FAR OFF, at a great distance. FAR ABOUT, going much out of the way. FROM FAR, from a great distance. FAR SPENT, in *OE.*, well advanced; nearly at an end; well passed away: see FARTHER and FURTHER.

FARAD, n. *fär'äd* [after *Faraday*]: see ELECTRICAL UNITS.

FARADAY, *fär'a-dä*, MICHAEL, D.C.L.: one of the most distinguished chemists and natural philosophers of the present century: 1791, Sep. 22—1867, Aug. 25; b. Newington, near London; son of a blacksmith. F. was a splendid instance of success obtained by patience, perseverance, and genius, over obstacles of birth, education, and fortune. He was early apprenticed to a bookbinder; yet devoted his leisure hours to science, and made experiments with an electrical machine of his own construction. Chance having procured him admission, 1812, to the chemical lectures of Sir H. Davy (q.v.), then in the zenith of his fame, he ventured to send to Davy the notes he had taken, with a modest expression of his desire to be employed in some intellectual pursuit. Davy seems to have at first endeavored to discourage him, but finding him thoroughly in earnest, soon engaged him as his assistant at the Royal Institution. He travelled with Davy to the continent, as assistant and amanuensis. On their return to London, Davy confided to him the performance of certain experiments, which led in his hands to the condensation of gases into liquids by pressure. Here he first showed some of that extraordinary power and fertility which have given his name celebrity, and which led to his appointment, 1827, to Sir H. Davy's post of prof. of chemistry in the Royal Institution. In the following summary his more important discoveries and published works are arranged, not chronologically, but according to various departments of science.

In chemistry, his treatise on *Chemical Manipulation*, 1827; 2d ed. 1842, is even now a very valuable book of reference. His *Lectures on the Non-metallic Elements*, and *Lectures on the Chemical History of a Candle*, delivered at the Royal Institution 1860, were published shortly afterward. Notable as discoveries or investigations of a high order are—New Compounds of Chlorine and Carbon, 1821; Alloys of Steel, 1822; Compounds of Hydrogen and Carbon, 1825; Action of Sulphuric Acid on Naphthaline, 1826; Decomposition of Hydrocarbons by Expansion, 1827; and the very valuable series of experiments 1829–30, on the manufacture of Glass for Optical Purposes, which resulted in one of his greatest discoveries, mentioned below.

FARADAY.

As practical applications of science, his Preparation of the Lungs for Diving, and Ventilation of Light-house Lamps, are conspicuous; also his celebrated letter on Table-turning, and his lecture on Mental Education.

Of his publications on physical science, the most prominent are the Condensation of the Gases (already referred to): Limits of Vaporization, Optical Deceptions, Acoustical Figures, Regelation, Relation of Gold and other Metals to Light, and Conservation of Force. Of these, the condensation of gases into liquids and solids, though previously effected by others (and F. was ever foremost to acknowledge another's priority), he really made his own, not only by the extent and accuracy of his experiments, but by the exquisite experimental methods by which he effected the results. His ideas on regelation, and its connection with the motion of glaciers, have not had universal acceptance, though (see HEAT: ICE: GLACIER) there is no dispute as to his correctness in *facts*. In regard to Conservation of Force, there can be no doubt that he was led into a fallacy, by mistaking the technical use of the word *force* (see FORCE), for in his article on the subject he describes experiments made with the view of proving the conservation of *statical*, not *dynamical* force, whereas the doctrine of conservation asserts merely the conservation of 'energy,' which is *not* statical force. He *may* be right also, but if so, it will be by a new discovery, having no connection whatever with 'conservation of energy.'

His Christmas lectures at the Royal Institution, though professedly addressed to the young, are profitable to all. His manner, his unvarying success in illustration, and his felicitous choice of expression, though the subjects were often most abstruse charmed and attracted all classes of hearers. *Lectures on the Physical Forces*, is a simple work, but in reality most profound, even in its slightest remarks.

But the great work of his life is the series of *Experimental Researches on Electricity*, published in the *Philosophical Transactions* during more than 40 years. Fully to understand all the discoveries contained in that extraordinary set of papers, would require a knowledge of all that has been discovered during that time as to Electricity, Magnetism, Electro-magnetism, and Diamagnetism. The following, almost all, are discoveries of the *first* order. They are, in the order of publication, nearly that of discovery also: 1. Induced Electricity, 1831, comprehending and explaining a vast variety of phenomena, some of which have already been applied in practice (especially as Magneto-electricity) to light-houses, electro-plating, firing of mines, telegraphy, and medical purposes. Electric currents derived from the earth's magnetism. 2. The Electronic State of Matter, 1831; 3. Identity of Electricity from Different Sources, 1833; 4. Equivalents in Electro-chemical Decomposition, 1834; 5. Electrostatic Induction—Specific Inductive Capacity, 1838; 6. Relation of Electric and Magnetic Forces, 1838; 7. The Electricity of the Gymnotus, 1839; 8. Hydro-electricity, 1843; 9. Magnetic Rotatory Polarization, 1846, effected by means of the optical glass

FARADIC—FARCE.

already mentioned; 10. Diamagnetism and the magnetic Condition of *all* Matter, 1846; 11. Polarity of Diamagnetics, and the Relation of Diamagnetism to Crystalline Forces, 1849; 12. Relation of Gravity to Electricity, 1851 (this, as before remarked, is F.'s attempt to prove a conservation of *statical* force). 13. Atmospheric Magnetism, 1851. An attempt to explain the diurnal changes of the earth's magnetic force by the solar effect on the oxygen of the air.

F., who had received a pension 1835, was in 1858 appointed a house in Hampton Court. In 1862 he gave his last discourse on 'gas-furnaces;' and advocated the use of magneto-electric light in light-houses. In 1865 he resigned the position of adviser to the Trinity House, also that of director of the laboratory of the Royal Institution. See *Life* by Tyndall (1869), Bence Jones (1870), and J. H. Gladstone (1872).

FARADIC, a. *fa-rād'ik* [F. *faradique*]: pertaining or relating to faradization. **FARADISM**: same as **FARADIZATION**.

FARADIZATION: see **ELECTRICITY, MEDICAL**.

FARALLONE ISLANDS, *fā-rāl-yō'nē*: cluster of six rugged, pointed islets in the Pacific Ocean, 23½ m. w. by s. of the Golden Gate, or entrance to the bay of San Francisco, Cal. The s.e. and largest extends nearly a m. e. and w., is 340' ft. high, contains numerous caves, and has a light-house on its tallest peak. All the islands are frequented by sea-gulls, murre, shags, and sea-parrots, beside rabbits and sea-lions; and are owned by a company which gathers the eggs of the gull and murre for the San Francisco market, where they command 25-35 cents per dozen.

FARANDOLA, n. *fā-rān'ā-lā* [F. *farandoule*]: dance popular among the peasants of the south of France and the neighboring part of Italy; called sometimes the Spanish Dance.

FARCE, n. *fārs* [F. *farce*, the stuffing in meat—from L. *farciōrē*, to stuff—*lit.*, force-meat or stuffing]: anything stuffed with foreign matters; a dramatic piece of a low comic character, full of exaggeration and drollery; anything absurdly exaggerated. **FARCED**, a. *fār'sēd*, in OE., stuffed. **FARCEUR**, n. *fār-sēr* [F.]: writer of farces; a joker. **FARCICAL**, a. *fār'sī-kāl*, of or relating to a farce; droll. **FAR'CICALLY**, ad. *-vē*.—*Farce* differs from comedy proper in degree and not in kind. The aim of both is to excite mirth; but while the former does so by a comparatively faithful adherence to nature and truth, the latter takes much greater license, and does not scruple to make use of any extravagance or improbability that may serve its purpose. It does not, therefore, exhibit, in general, a refined wit or humor, but contents itself with grotesque rencontres, and dialogues provocative of fun and jollity. The name is differently explained. In any case, it comes originally from the Latin *farcere*, to stuff, but while Adelung says that, in the middle ages, *farce* signified in Germany certain songs between the prayers during divine service, others derive it from the Italian *farsa*, this from the Latin *farsum*



Fan-tracery, from the Cloisters, Gloucester Cathedral.



Fan-tracery Vaulting, Beauchamp
Chapel, Warwick.

Pl. 11.



Farthingale, time of Queen Elizabeth.

FARCY—FARDEL-BOUND.

(stuffed); while Paolo Bernardi states that it comes from a Provençal word *farsum*, meaning a *ragout*, or mess of different ingredients, an opinion which has this in its favor—that the *dramatis personæ*, *Jack-pudding*, etc., were generally named after special dishes or mixtures. The first farces are said to have been composed by the society of the *Cleres de Bazoche* in Paris, about 1400, as a contrast to the ecclesiastical plays performed by the religious orders. The most widely celebrated and the oldest is the *Farce de Maître Pierre Pathelin*, which some assign to the 13th c., but which was more probably executed by one Peter Blanchet, about 1480. Subsequently, Molière elevated and refined the farce into pure comedy, in his *Médecin Malgré lui*, *Malade Imaginaire*, *Les Fourberies de Scapin*, and other inimitable productions. In England, the origin of the modern farce dates from about the beginning of the 18th c. It then began to be regarded as something distinct from comedy proper, and to constitute a special theatrical entertainment. Of the numerous farces which have been performed before English audiences, only those of Samuel Foote have kept a place in literature.

FARCY, n. *fâr'si* [It. *farcina*; F. *farcin*—from mid. L. *farcimînûm*]: a disease in horses allied to the glanders (q.v.) which it usually precedes and accompanies. The absorbent glands and vessels, usually of one or both hind limbs, are inflamed, tender, swollen, hard, and knotted. The vitiated lymph thus poured out softens, and ulcers, or farcy buds appear. Unlike the ulcers of glanders, they are curable, but require time and care. They must be scarified with the hot iron, which, to prevent their spreading, may also be gently run over the adjacent sound skin. Good feeding and comfortable lodgings are essential, and, if not interfering with the appetite, tonics, should be given, such as a drachm each of sulphate of copper and iodine, twice daily. **FARCY-BUD**, n. in *vet. surg.*, little tumor which appears on the face, neck or inside of the thigh of horses; generally the first indication of farcy.

FARDAGE, n. *fârd'ij* [F.]: in *naut.*, dunnage, loose wood, coir, etc., stowed among cargo to prevent it from shifting, or placed below dry goods to keep them from being injured by bilge-water.

FARDEL, n. *fâr'dèl* [Sp. *fardillo*, a bale, a bundle: OF. *fardele*—from F. *farde*, a bale—from Ar. *farda*, one of two bales on a camel's humps]: in *OE.*, a little pack; a bundle: V. to make up in little bundles. **FARDELLING**, imp. **FARDELLED**, pp. *fâr'dèld*.

FARDEL-BOUND: disease of cattle and sheep, consisting in impaction of the fardel bag, or third stomach, with food, which is taken in between the leaves of this globular stomach, there to be fully softened and reduced. When the food is unusually tough, dry, or indigestible, consisting, for example, of overripe clover, vetches, or rye-grass, the stomach cannot moisten and reduce it with sufficient rapidity; fresh quantities continue to be taken up, until the overgorged organ becomes paralyzed, its secretions

FARDINGALE—FAREL.

dried up, and its leaves affected with chronic inflammation. The slighter cases common among stall-fed cattle are 'loss of cud,' indigestion, and torpidity of the bowels. In severer form, there is also fever, grunting, swelling up of the first stomach, and sometimes stupor or epilepsy. The overgorged stomach can, moreover, be felt by pressing the closed fist upward and backward underneath the false ribs on the right side. The symptoms often extend over ten days or a fortnight. Purgatives and stimulants are to be given. For a full-grown beast, give, in three or four bottles of water or thin gruel, $\frac{1}{2}$ lb. each of common and Epsom salt, 15 ground croton beans, a dram of calomel, and two ounces of ginger. If no effect is produced, repeat this in 12 or 15 hours. Inject soap and water clysters every hour, withhold all solid food and allow only sloppy mash, treacle and water, or thin linseed tea. An occasional bottle of ale, with an ounce or two of ginger, often expedites the action of the physic, and wards off nausea and stupor.

FARDINGALE: see **FARTHINGALE**.

FARDING-BAG, *n.* *fård'ing bæg*: the first stomach of a ruminant animal, in which green food lies until it is chewed over again; the rumen.

FARE, *n.* *fär* [*Icel.* *far*, previous, passable; *feria*, a passage-boat; *Ger.* *fähre*; *Dut.* *vaer*, a ferry: connected with succeeding **FARE**]: the price or sum paid for conveyance by land or water; a passenger; in *OE.*, a journey; a passage: *V.* in *OE.*, to go; to travel. **FA'RING**, *n.* a journey.

FARE, *v.* *fär* [*Goth.* *faran*; *Icel.* *fara*; *Ger.* *fahren*, to go, to get on]: to be in any state, good or bad; to get on; to feed; to be entertained; to happen: *N.* prepared food; provision; victuals; entertainment. **FA'RING**, *imp.* **FARED**, *pp.* *färd*, got on; succeeded. **TO FARE WELL OR ILL**, to be prosperous or the contrary.

FARE-FOLK, *n.* *fär'fök* [*etym.* doubtful; probably for fairy-folk]: fairies; elves.

FAREHAM, *fär'ham*: market-town and sea-bathing place in the s. of Hampshire, England, on a creek at the n.w. end of Portsmouth harbor, 12 m. e.s.e. of Southampton, 9 m. n.n.w. of Portsmouth. It has manufactures of earthenware.—*Pop.* (1881) 7,171.

FAREL, *fä-rèl'*, **GUILLAUME**: 1489–1565, Sep. 13; b. in Dauphiné: one of the most active promoters of the Reformation in Switzerland. He studied at Paris, and was distinguished at first by his extravagant zeal for the practices of the Rom. Cath. Church. 'Truly,' says he in one of his letters, 'the papacy itself was not so papistical as my heart.' Intercourse with the Waldenses, and with his friend Lefevre d'Étaples, induced him to study the Scriptures; the result was his conversion to Protestantism, and F., who was by nature vehement even to indiscretion, immediately commenced to proselytize. The chief scene of his labors was France and Switzerland. At Basel, 1524, Feb. 15, he

FAREL.

opened his career of controversy and evangelization by publicly sustaining 30 theses on the points in dispute between Rom. Catholicism and Protestantism. In less than two months, he was compelled to leave, mainly on account of a quarrel with Erasmus, whom, on account of his moderate or trimming policy, F. had compared to Balaam. F. went next to Strasbourg, afterward to Montbeliard, where his iconoclastic way of preaching the gospel excited the alarm of his friends, several of whom, Œcolampadius among others, censured him sharply for his violence. His zeal was manifested next in the canton of Bern. It was chiefly through his exertions that the towns of Aigle, Bex, Olon, Morat, and Neuchâtel followed the example of Bern in embracing the Reformation. In 1532, he went to Geneva, where his success was at first so great, that on account of the agitation excited, he had to leave the city. He returned 1533, was again compelled to withdraw, but once more entered it 1534. This was his year of triumph; the Reformers filled the churches, and the Rom. Cath. clergy, who had made themselves odious to the citizens by abetting the despotic schemes of the Duke of Savoy, retired to Lausanne and Fribourg. In 1535, Aug., the town council of Geneva formally proclaimed the Reformation. F., however, was a missionary, not a legislator, and the organization of the Genevan Church passed into the hands of Calvin (q.v.). The severity of the new ecclesiastical discipline produced a reaction, and in 1538, Apr., the two reformers were expelled from the city. F. took up his residence at Neuchâtel, where the reformed church was in deplorable disorder. He composed its differences, and drew up a constitution, which it accepted, after long and stormy debates, 1542. In Sep. he was fighting the battle of the Reformation at Metz. After his return to Neuchâtel, he frequently visited Calvin, whose authority in Geneva had been completely restored. It was on one of these occasions that he was present at the burning of Servetus, and though not, comparatively speaking, a bigoted Calvinist, he allowed his orthodoxy on that occasion to choke his humanity, exclaiming, as the unhappy heretic uttered his last prayer to God from the flames: 'See what power the devil has over one who has fallen into his hands.' In 1557, with Beza, he was sent to the Prot. princes of Germany, to implore their aid for the Waldenses, and on his return—inexhaustible in his activity—he sought a new sphere of evangelistic labor in the regions of the Jura Mountains. When on the verge of threescore-and-ten, he married a young wife, much to Calvin's disgust, who sarcastically speaks of him under the circumstances as 'our poor brother.' But neither his newly formed domestic ties, nor the infirmities of age, could quench his missionary zeal. In 1560-1, he went to his native Dauphiné, and passed several months at Gap, preaching against Romanism with all the ardor of his youth. In 1561, Nov., he was thrown into prison, but was soon rescued by his friends. In 1564, he paid a visit to the dying Calvin; his strength, however, was nearly exhausted, and he expired at Neuchâtel, leaving a son named Jean, who

FAREWELL—FARIBAULT.

survived him only three years. F. was a man of extensive scholarship, and wrote largely, but his works very inadequately represent the genius of the man. Compare Kirchofer's *Das Leben Wilhelm Farel's* (2 vols. Zurich, 1831-33), and C. Schmidt's *Etudes sur Farel* (Strasbourg, 1834); also his *Wilhelm F. und Peter Viret* (1860).

FAREWELL, n. *fär'wël* [*fare*, and *well*]: a kind wish or wish of happiness at parting; an adieu. **ADJ.** leave-taking, as farewell wishes. **FARE-YOU-WELL**, ad., or **FAREWELL**, ad. good-by; adieu.

FAREWELL, *fär'wël*, CAPE: see CAPE FAREWELL.

FAR-FET, a. *fär'fët*: in *OE.*, abbreviation of *far-fetch*, or *far-fetched*; studiously sought for; highly elaborated. **FAR-FETCHED**, *-fëcht*, brought from remote places; not introduced naturally and easily; over-strained.

FARGO, *fär'gô*: city, cap. of Cass co., N. Dak.; on the Red River of the North, and the St. Paul Minneapolis and Manitoba Short Line and the Northern Pacific railroads; 251 m. n.w. of St. Paul, 254 m. w. of Duluth, opposite Moorhead, Minn. It is at the head of navigation on the Red river, in the great agricultural region of the famous Red river valley, is an important wheat-shipping market, and the commercial centre of the "new northwest." It contained (1890, Mar.) 4 national banks (cap. of those reporting \$350,000), 1 state bank, 2 private banks, and 1 mortgage and investment company; 12 churches; Presb. seminary, Congl. college, and Rom. Cath. acad.; commodious Y. M. C. A. building; high and grammar schools, with 2 brick buildings (cost \$80,000 and \$15,000); 28 hotels; 3 public halls; opera-house; theatre; co. court-house (cost \$100,000); Holly system of water-works; gas and electric-light plants; street railroad; and 3 daily, 3 weekly, and several monthly periodicals. The industries of F. included the largest agricultural implement depot in the n.w.; 3 grain elevators, with capacity of 250,000 bushels; planing and paper mills; extensive brick-yards; round-houses and car-shops of the Northern Pacific railroad; and numerous minor manufactories. In 1871 the site of F. was comprised in an Indian reservation; 1873 the Indian title was extinguished, the town plotted, and named after William G. Fargo (1818, May 20—1881, Aug. 3), a director of the Northern Pacific railroad, and a pioneer in the express business. Then came a period of inactivity, occasioned by the financial panic and the cessation of the railroad construction. Late in 1875 the remarkable fertility of the region was demonstrated by the success of the great Dalrymple farm, and F. received a large share of the attention given that part of the n.w. In 1878 it had pop. less than 800, and in the following year the first decided and marked movement, so far as local development is concerned, was made. Since then unflinching crops, the completion of the railroad, the construction of several branch roads, and the energy of its citizens have made it

FARIA Y SOUSA—FARIBAULT.

one of the notable new cities of the great west. Pop. (1880) 2,693; (1885) 8,201; (1890) 5,613.

FARIA Y SOUSA, *fã-rê'ã ê sô'zã*, MANOEL: 1590, Mar. 18—1649, June 3; b. of an anc. family, at Caravella, province of Entre Minho e Douro, Portugal: historian and poet. He studied at the univ. of Braga, and entered the service of the Bp. of Oporto; but shortly after 1613 he went to Madrid, where, however, he did not long remain. In 1631, he obtained the office of sec. to the Spanish embassy at Rome, where his extensive acquirements procured him the notice of Pope Urban VIII. and of all the learned men of the city. After some time, he returned to Spain, and died at Madrid. F.'s writings are partly in Spanish, partly in Portuguese. Of th. former, are, *Discursos morales y politicos* (2 vols. Madr. 1623-26), *Epitome de las Historias Portuguesas* (Madr. 1628), *Comentarios sobre la Lusitana* (2 vols. Madr. 1639), *Asia Portuguesa* (3 vols. Lisbon 1666-75), *Europa Portuguesa* (3 vols. Lisbon 1678-80), *Africa Portuguesa* (Lisbon 1681), and the greater portion of his poems, which he collected under the title of *Fuente de Aganippe o Rimas Varias* (Madr. 1644-46). These poems consist of sonnets, eclogues, canzones, and madrigals. F., however, composed about 200 sonnets and 12 eclogues in Portuguese; and it is mainly by these, and by three theoretical treatises on Poetry, that he has influenced the development of the poetic literature of Portugal, in which he was long regarded as an oracle. His poetry shows talent and spirit, but is on the whole tasteless and bombastic.—F. is not to be confounded with another Portuguese author of the same name (b. Lisbon 1581, d. Evora 1655), who was one of the most learned numismatists of his age.

FARIBAULT, *fã-rê-bô'*: city, cap. of Rice co., Minn.; on the Cannon river at its junction with the Straight river; on the Chicago Milwaukee and St. Paul railroad; 15 m. n. of Owatonna, 53 m. s. of St. Paul. It contains a state asylum for the deaf, dumb, and blind, fine court-house, public library, Seabury (Prot. Episc.) Divinity School, Rom. Cath. acad. and convent, the Shattuck School, 2 national banks (cap. \$130,000), 14 churches, and manufactories of bricks, plows, furniture, and carriages. Pop. (1870) 3,045; (1880) 5,415; (1885) 6,459; (1890) 6,524.

A conditional transfer of the Rom. Cath. parochial schools in F. and Stillwater to the state authorities by Abp. John Ireland (q.v.) 1891 led to a spirited discussion in Rom. Cath. and Prot. circles, to the toleration of the scheme by the Sacred Congregation of the Propaganda and the pope 1892, and to the designation of the abp.'s educational arrangement as the 'Faribault plan.' The 'plan' was discontinued in Faribault 1893, owing to differences that arose between the school board and the ecclesiastical authorities over the assignment of two Protestant teachers to a building which had been rented from the Roman Catholics. On the advice of the archbishop the lease was annulled.

FARIDPUR—FARINELLI.

FARIDPUR, or **FURREEDPORE**, *fär-əd-pôr'*, most western dist. of the Dacca div., of Bengal, British India; bet. lat. 22° 47' 53" and 23° 54' 55" n., long. 89° 21' 50" and 90° 16' e.; bounded n. and e. by the Ganges or Padma river, w. by the Chanduá and Madhumati rivers, and s. by Bakarganj; 2,267 sq. m. The surface in general is low, flat, and swampy, and 1,143 sq. m. were under cultivation, more than one-half in rice, in 1871. F. is traversed by 3 large rivers, navigable the year round by the largest Indian steam vessels, and these rivers have numerous small branches which accommodate flat and light draught boats. Beside the Eastern Bengal railroad, which extends 22 m. w. to e. in the n., F. has 3 important railroads, the Calcutta and Jessor, 19 m. long, F. and Kalingar, 16 m., and the F. and Taíma, 10 m. The whole dist. is frequently under water during inundations, and the huts of many villages are built on artificial elevations. F. is advancing rapidly in prosperity under British administration.—Pop. (1886) 1,631,734.

FARINA, n. *fä-rē'nä* or *-rī'*—[L. *farīnā*, meal—from *far*, grain: It. *farīna*: F. *farīne*]: meal or flour; the fine dust or pollen of flowers collected by bees for feeding their larvæ (see **BEĒ**); starch. **FARINACEOUS**, a. *fär'ī-nä-shūs*, mealy; consisting or made of flour; capable of yielding flour or starch. **FARINOSE**, a. *fär'ī-nōs*, yielding or containing farina; in *bot.*, *entom.*, etc., covered with a light dust or powdery substance, like meal.—*Farina* is a term frequently extended to many substances, which agree with the meal of the corn-plants or *Cerealia* (q. v.), in containing much starch, and food made of such substances is often called *farinaceous*, its qualities more or less resembling those of the food derived from the *cerealia*. Of the different kinds of farina, those produced by mere trituration of the seeds of grasses (corn), hold the first place for usefulness. Most similar to them are those obtained in the same manner from certain other seeds: see **CEREALIA**. The farina of the different kinds of Pulse (q. v.), or seeds of leguminous plants, has considerably different properties. For the qualities, chemistry, commercial importance, etc., of the different kinds of meal, see **MEAL**.—Other farinaceous substances, consisting chiefly of starch, are obtained from roots—often from tubers—of plants of very different natural orders; some kinds also, as sago, from stems. Cassava meal, which contains with starch, much vegetable fibre and proteine or albuminous substances, is commonly called farina (*Farinha*) in many parts of S. America, where it is a principal article of food.—*Fossil farina*, *mountain milk*, or *Agaric mineral*, is a deposit of silicified animalcules, obtained from China, etc. In 100 parts, it consists of silica, 50½, alumina 26½, magnesia 9, water and organic matter 13, with traces of lime and oxide of iron.

FARINELLI, *fä-re-něl'le* (real name, CARLO BROSCO); 1705, Jan. 24—1782, July 15; b. Naples: soprano singer. He studied music with Parpara, sang with great success in the leading Italian theatres, went to London 1734 and performed in England three years, and after a brilliant season in Paris, settled in Madrid 1737. There he became the

FARINI—FARIS ECCHIDIAK.

favorite of King Philip V. and of his successor Ferdinand VI., who paid him \$10,000 per annum for singing to him exclusively. At his instigation Ferdinand organized a theatre in the royal palace, and F. engaged and directed a company of eminent performers from Italy. He ruled the court 20 years, and was ordered out of the kingdom by Charles III. 1762.

FARINI, *fâ-rê' nê'*, CARLO LUIGI: 1822-66; b. Russi, in Ravenna, in the n. of Italy: author and statesman. Having, with great success, studied medicine at Bologna, F. first became known by several medical publications, and soon afterward by contributions to scientific periodicals. In 1841, 2, having entangled himself with politics, he was obliged to leave the Roman States, and change his residence repeatedly until he finally settled at Turin. The amnesty following shortly upon the accession of Pio Nono, opened to F. not only his native country, but also a new career, through the liberal system inaugurated by the supreme pontiff. In 1847, he was called into the reformed ministry, as a substitute to the home sec.; in 1848, he was present in the suite of Carlo Alberto at Volta, and after the flight of the king, protested against the proclaiming of a republic. During the short ministry of the unfortunate Rossi (q.v.), F. was director-gen. of the sanitary and prison dept. at Rome, from which post, however, he retired as soon as the reaction under Antonelli began to be established. Upon the occupation of Rome by the French, F. became once more an exile, but for a short time only, for in Piedmont he found a home as well as public honors. In 1850, he held the seat of minister of public instruction in the cabinet of Victor Emmanuel II., and on retiring from office, was named a member of the supreme council. When Central Italy resolved to annex itself to the kingdom of Victor Emmanuel, by means of universal suffrage, it was F. who directed the popular mind with such admirable success that, on the day of ballot, not one vote was delivered asking for a separate kingdom. As gov. of Central Italy, he showed undaunted courage against the threats of Austria, and exhibited a thoroughly consistent moderation against the unruly promptings of the Mazzinians. The same qualities accompanied his measures when the newly acquired kingdom of Naples was to be reorganized. In 1861, F. became minister of commerce and public works. In 1862, he took office as pres. of the cabinet, which he resigned 1863. It has been said that 'Farini was the mind of Italy, as Garibaldi was its sword.' Among his literary productions may be mentioned, *Il Stato Romano* (The Roman State), translated into English under the superintendence of the Right Hon. W. E. Gladstone (London 4 vols. 1859); *Storia d'Italia* (History of Italy), a continuation of Botta's celebrated work. F. was also a contributor to Count Cavour's *Risorgimento*.

FARIS ECCHIDIAK: Arab poet and littérateur: b. 1796. In religion, he is a Syrian Christian. He studied at Cairo under the ulamas of the mosque of El-Azhar. He was afterward invited to Malta by an English missionary

FARL—FARLOW.

soc., who wanted his services in their Oriental printing establishment. The dedication of a poem to the Bey of Tunis about 1847, induced that monarch to send a war-vessel to Malta, which brought the poet to Tunis, where he had a distinguished reception, and rich presents. Subsequently, he went to England, where he was employed in revising the text of a translation of the Bible into Arabic, by the Soc. for the Propagation of the Scriptures. In 1851, he published in London the New Testament in Arabic. After residing in France—and publishing there, with M. G. Dugat 1854, a French grammar in his native tongue for use of the Kabyles of Algeria—he returned to London, and published his principal work, *La Vie et les Aventures de Furiak* (Paris 1855), a narrative interspersed with poems.

FARL, or FARLE, n. *fārl* [AS. *feorth-dael*]: in *Scot.*, one part of a scone or cake cut into four equal parts.

FARLEY, *fār'li*, MICHAEL: 1719–1789, June 20; b. Ipswich, Mass.: patriot and soldier. He was a member of the general court, delegate to the provincial congress, 1774–75, member of the house of representatives, and the supreme executive council, and for several years was maj.gen. of the 2d div. of Mass. militia.

FARLOW, *fār'lō*, WILLIAM GILSON, M.D.: botanist: b. Boston, 1844, Dec. 17. He graduated at Harvard Univ. 1866, and at its medical school 1870, spent several years in special study in Europe, was appointed adjunct prof. of botany at Harvard Univ. 1874, and was elected prof. of cryptogamic botany 1879. He wrote the *Progress of Botany* in the Smithsonian Institution Reports 1879–86, and has published *The Potato Rot* (Boston, 1875); *Diseases of Olive and Orange Trees* (1876); *The Gymnosporangia, or Cedar Apples of the United States* (1880); *The Marine Algae of New England* (1881); and *Introduction to Cryptogamic Botany* (1888). He is a fellow of the American Assoc. for the Advancement of Science, and a member of the National Acad. of Sciences.

FARM.

FARM, *n.* *fárm* [AS. *feorm*, a supper, hospitality; *feor-mian* to supply with food. F. *ferme*, an agreement, a farm—from *mid. L. firma*, a feast, a farm—from *firmus*, durable, lasting—*lit.*, a portion of land which supplies food]: a portion of land employed to raise food: V. to let or lease at a certain rent, as a portion of land, taxes, etc.; to cultivate land. **FARM'ING**, *imp.*: N. the business of a farmer. **FARMED**, *pp. fárm'd.* **FARMER**, *n. fárm'ër*, one who cultivates land; one who leases taxes at a fixed rent. **TO FARM TAXES**, to let or lease taxes.—**SYN.** of 'farmer:' agriculturist; husbandman; tiller; cultivator.—*Farm*, in the United States, is a portion of land in pasture or cultivation managed usually by the owner: in Britain, a piece of land in pasture or cultivation, usually held in lease by a tenant from the proprietor. The honorable and independent position of farmers in the United States is well-known.—In Europe, the tenure on which land is held by farmers varies in different countries. In some parts of continental Europe, the farmer hires the land on the principle of a kind of partnership with the proprietor: see **METAYER**. In England, much of the land is let for a certain annual rent, and mostly either by a yearly term, or at the good-will of the landlord. Leases of different durations have latterly been introduced. Under the old Scotch 19-years' lease, the farmer is encouraged to starve the land towards the close of the period of contract, in order to recoup himself for his outlays in manure. The practical result is that the land is fully productive about half the duration of the lease. The vastly increased expenditure connected with farming, and the growing and already great necessity for the most being made of the limited land resources of Great Britain, call for more security to the tenant's capital than the lease provides. A strong movement has begun in Scotland and England for compensation to outgoing tenants for permanent improvements, and even unexhausted manures. This is as much a tenant's as a landlord's question, as it will require more capital to enter a farm than is presently needed. The landlord presumably provides the houses for the farms, but the higher farming of recent years has rendered the former supply of buildings insufficient, and there is difficulty in obtaining proper house accommodation on many farms, on estates where the landlord's capital happens to be locked up by the keys of entail. The method of paying rent for farms in Scotland is not uniform; in some districts the rent is a fixed sum; in others, such as the Lothians and best wheat-growing districts, it is often partly a fixed sum and partly in grain, etc.: see **FIARS**. At all times, however, the landlord has a right of Hypothec (*q.v.*) over the crops, and can take measures to avoid being defrauded of his proper claims. On land adapted for green cropping, and remote from towns, large farms form good subjects for capitalists, and consequently prevail. Stiff clay soils are rather against extensive culture. Where crops are grown that require much hand-labor, farms become small. Flax, rape, vines, and market-garden produce all tend to lessen the size of farms. In new countries farms are mostly small. Grazing farms, whether

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in the Scotch Highlands, Australia, or America, form good outlets for large capitalists.—For the different crops, animals, and processes, see the respective titles. See also AGRICULTURAL EDUCATION: AGRICULTURAL SOCIETIES: AGRICULTURE.

FARM BUILDINGS: constructions requisite for the various processes of husbandry. Proper buildings are essential to economical disposing of the produce of the farm. The grain crops are usually thrashed there, and a large portion of the green crops is consumed by stock, which must be provided with shelter from the cold. When few turnips were raised, and few cattle fed, large open courts were best suited for converting the straw into manure. Now in many cases, the excrements of the stock are sufficient for wetting all the straw, and hence has arisen the practice of feeding in covered courts and in boxes. In this case, the solid and liquid excrements are carted out with the straw which acts the part of a sponge. This is an excellent way of manufacturing home-made manure; it takes much straw, however; and as more green crops are raised and consumed on the farm, sufficient straw cannot always be got to absorb all the liquid; hence, a saving of the straw is effected by stall-feeding, when the excess of liquid must be collected into tanks, and otherwise disposed of. When the high price of ammonia is remembered, also that liquid manure contains a high percentage of ammonia, the utility of husbanding this material is evident. Liquid manures should be absorbed by moss or soil, or be carted out, and distributed by pipes, while the plants are growing, otherwise part will be washed out of the soil. Covered farm-yards are increasingly used, as the cheapest and best way of erecting farm-offices.

Ventilation.—Without good ventilation, a covered home-stead must be a nuisance. All the apartments are so arranged that unless fresh air circulate through them, and they are kept perfectly clean, there must constantly be unwholesome effluvia in the interior—the foulness of one apartment being communicated to another. One system of ventilating a farmstead is here indicated—demanding, of course, ordinary care to keep the different houses clean,—Under each feeding-passage is built a circular air-shaft, 30 inches in diameter; in connection with these are feeding-mouths with gratings on the outside of the building; inside, are numerous finely perforated gratings; by sliding-valves, wrought by a cord and pulley, the supply of air is regulated. Besides these, there are gratings every 10 or 12 ft. along the exterior walls, perforated so as to admit near the floor considerable air. The roof, too, is provided with ventilators with vertical spars, and openings are left here and there in the sarking, as induction and eduction tubes. Numerous perforated apertures throughout the building admit twice the quantity of air required for the respiration of the animals, and are so under command that they will admit neither flies in summer, nor too much cold air in winter.—The above system of ventilation is somewhat expensive. A cheap yet efficient system is to cover the yards with pan

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tiles without plaster or lath. See *The Book of Farm Buildings*, by Henry Stephens, F.R.S.E., and R. Scott Burn (Edin., Blackwood & Sons, 3d ed. 1871).

FARM LABORERS: people employed by the farmer in his processes of husbandry. In the vast area and varied agriculture of the United States, there is unlimited variety in the terms of engagement and rates of wages for such laborers. The diversified problem solves itself in practice under our free institutions. In the British islands, the collision between inherited usages and modern social demands, gives rise to serious questions, concerning the class known there as Farm-servants, whose wages are far lower than those of our more independent agriculture workers. The introduction of large farms caused a wide difference to arise in Britain between the condition of master and servant. The latter has had his condition partially meliorated, through very much remains yet to be done. Large farms effect economy in amount of labor, and where these superseded the small holdings or pendicles, a certain number of the population had to betake themselves to the towns or the colonies: this diminished population in country districts. The general advance, however, in the wages of labor has been to some extent shared by farm-servants for some years, and they are now better paid, though in general they are still miserably housed. Farmers now complain of the comparatively inferior class of servants even for the increased wage. In the agricultural counties wages are lower than in the manufacturing districts.

FARMER, fâr'mér, JOHN: 1789, June 12—1838, Aug. 13; b. Chelmsford, Mass.: genealogist. He spent the early part of his life teaching school and in business, and afterward applied himself to historical, antiquarian, and genealogical research. He was a founder of the N. H. Hist. Soc., and a member of numerous hist. and literary societies, published *Genealogical Register of the First Settlers of New England* (1829), *History of Billerica* (1806), *History of Amherst* (1820), *Gazetteer of New Hampshire* (1823), and contributed largely to the *Collections* of the N. H. and Mass. hist. societies.

FARMER, RICHARD, D.D.: 1735, Aug. 28—1797, Sep. 8; b. Leicester, England. He was entered a pensioner of Emmanuel College, Cambridge, 1753. In 1760, he took his degree M.D., and was appointed classical tutor of his college. It is not known when he took orders, but, while tutor, he acted as curate at Swavesey, a village eight m. from Cambridge. In 1766, he published his *Essay on the Learning of Shakespeare* (reprinted 1789, 1821), to show the sources whence the great dramatist derived his knowledge of the ancients. F. proved that it was from translations, and that Shakespeare has often cited the phraseology, and even the errors, of the translators. In 1775, he was elected to the mastership of Emmanuel College, and 1778, chief-librarian of the university. In 1780, he obtained a prebendal stall at Lichfield, which he resigned 1788 for the office of canon residentiary of St. Paul's.

FARMERS' ALLIANCE.

FARMERS' ALLIANCE: association of farmers for advancing the interests of the agricultural population. The term F. A., in strictness, designates only one of many unions of farmers, but in common usage it is applied to all the politico-social and mutual-benefit organizations of agriculturists in the United States. Though these bodies exist as separate organisms, each with constitution, by-laws, officers, etc., of its own, the aims of all are nearly the same, and efforts are being made to unify them under a common name and a common constitution, or at least to procure their concurrent action for the common ends. The nature of these common ends may be understood from the resolutions passed 1890, Nov., by the national assembly of the Farmers' Mutual Benefit Assoc. (see at end of article), demanding revision of the patent laws; abolition of the national banking system; a circulating medium consisting of coin and U. S. treasury-notes; provision for loaning of money by the govt. to citizens, at moderate interest, on proper security; issue of govt. bonds of \$10, \$20, \$50, and \$100, bearing 2 per cent. interest, and redeemable at the option of the holder and the govt.; regulation of corporations by law; election of pres., vice-pres., and U. S. senators by popular vote.

The first considerable organization of farmers for politico-economic purposes was the *National Grange of the Patrons of Husbandry*: see HUSBANDRY, PATRONS OF. At the beginning of 1890 the Grange was organized in more than 30 states, and the number of active members was estimated at 150,000. Originally, the Grange did not contemplate organization of farmers for furtherance of agricultural interests through political action; the objects were rather mutual benefit, mutual improvement, commercial co-operation, and resistance to monopolies. It was asserted, 'emphatically and sincerely,' that 'the Grange is not a political or party organization.' The Grange was founded 1867.

A *Farmers' Alliance* was organized at Poolville, Parker co., Tex., 1879, by the exertions of William T. Baggett, who had, four yrs. previously, effected a union of the farmers of Lampasas co., under the same name, for resistance to land and cattle speculators. Like the Grange, the new organization declared itself non-political. Its purposes, as officially declared, were: 'to labor for the education of the agricultural classes in the science of economical government; to develop a better state, mentally, morally, socially, and financially; to create a better understanding, for sustaining civil officers in maintaining law and order;' and to assist one another in need. This assoc. was chartered by the state of Texas 1880; the state alliance was organized 1882: membership was restricted to white persons. At a convention (1886), 84 counties of Texas were represented. A union of the F. A. (of Texas) with the *Farmers' Union*, an assoc. of Louisiana farmers, was effected 1887, under the style, *Farmers' Alliance and Co-operative Union of Amer-*

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ica. The consolidated body sent organizers and lecturers into other states of the w. and s.w., and the order spread quickly through Mo., Ky., Tenn., N. C., S. C., Ga., Ala., and Miss. A similar organization, known as *The Agricultural Wheel*, had already been in existence for some years in Mo., Ky., and Tenn., having been founded 1882, at Des Arc, Prairie co., Ark. The 'Wheel' and the 'Alliance and Union' sent delegates to a convention at Shreveport, La., 1887, for effecting a union of the two bodies, which was accomplished the following year, under the title, *Farmers' and Laborers' Union of America*; the style was changed Dec., 1889, to *National Farmers' Alliance and Industrial Union*.

The *National Farmers' Alliance*, a body distinct from the last named, has its strength in Ill., Wis., Minn., Io., the Dakotas, Neb., Kan., and Mo.; it had its rise in Cook co., Ill., 1877, as a local body; a national organization was effected 1880, when 500 delegates from local bodies in Mass., R. I., N. Y., O., Ind., Mich., Ill., Wis., Io., Neb., Mo., Ky., and Tex. met for that purpose in Farwell Hall, Chicago. The object was declared to be: 'to unite the farmers of the United States for their protection against class legislation, the encroachments of concentrated capital, and the tyranny of monopoly; . . . to oppose, in our respective political parties, the election of any candidate, state or national, who is not thoroughly in sympathy with the farmers' interests; to demand that the existing political parties shall nominate farmers, or those who are in sympathy with them, for all offices within the gift of the people; and to do anything, in a legitimate manner, that may serve to benefit the producer.' 1890, Jan., the National F. A. had about 400,000 members.

The *Farmers' Mutual Benefit Association*, mentioned in the beginning of this article, had its rise in Johnson co., Ill., 1883, and was chartered under the laws of the state 1887. The local membership, 1890, is given as 200,000, confined almost wholly to Ill. and Ind., though the assoc. has organizations in 10 other states. The declared objects of the assoc. are: 'to unite the farmers of Ill. and of the United States in all matters pertaining to their interests; to improve the modes of agriculture, etc.;' the 'declaration of purposes' of the order says nothing about political action, but the members are pledged 'promptly and fearlessly to place the stamp of condemnation on every business and profession which, in their judgment, is calculated to interfere with farmers' rights.'

The *Farmers' League* originated in Mass.; its strength lies in the e. states, but it has a national organization, and is spreading to the w. and s.; its specific objects are 'to advance the farmer's political welfare, securing to him due recognition and just representation in all elective and appointive offices affecting his welfare.' In particular, the Farmers' League attends to the agricultural interests in the matter of senators and representatives in the legislature. The national officers of the

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Farmers' League, 1890, were: Geo. T. Powell, Ghent, N. Y., pres.; Herbert Myrick, Springfield, Mass., sec.; Walter P. White, Putnam, Conn., treas. The league is representative throughout. Any farmer may become a member on paying 50 cts. Five or more members may organize a town league, 5 towns a county league, 3 or more counties a state league.

The objects and aims of the several organizations may be understood from the foregoing account: the tendency of them all may be seen in the utterances of one of them—the National Farmers' Alliance and Industrial Union, which, 1890, gave expression as follows to its demands:

'We demand the abolition of national banks, and the substitution of legal-tender treasury-notes in lieu of national bank-notes, issued in sufficient volume to do the business of the country on a cash system—regulating the amount needed on a *per capita* basis, as the business interests of the country expand; and that all money issued by the government shall be legal tender in payment of all debts, both public and private.

'We demand that congress shall pass such laws as shall effectually prevent the dealing in futures of all agricultural and mechanical productions, preserving so stringent a system of procedure in trials as shall procure prompt conviction, and imposing such penalties as shall secure most perfect compliance with the law.

'We demand the free and unlimited coinage of silver.

'We demand the passage of laws prohibiting the alien ownership of land, and that congress take early steps to devise some plan to obtain all lands now owned by aliens and foreign syndicates; and that all lands now held by railroad and other corporations, in excess of such as is actually used and needed by them, be reclaimed by the government and held for actual settlers.

'Believing in the doctrine of "equal rights to all, and special privileges to none," we demand that taxation, national or state, shall not be used to build up one interest or class at the expense of another. We believe that the money of the country should be kept as much as possible in the hands of the people, and hence we demand that all revenues, national, state, or county, shall be limited to the necessary expenses of the government, economically and honestly administered.

'We demand that congress issue a sufficient amount of fractional paper currency to facilitate exchange through the medium of the United States mail.

'We demand that the means of communication and transportation shall be owned and operated in the interest of the people, as is the United States postal system.'

A later platform demands, among other things, the establishment of postal savings-banks by the govt.; opposes the issue by the United States of interest-bearing bonds, and demands the election of U. S. senators by direct vote of the people, each state to be divided into two districts of nearly equal voting-population.

FARMERS GENERAL.

FARMERS-GENERAL [Fr. *fermiers-généraux*]: name given before the French Revolution of 1789 to the members of a privileged association, who farmed or leased the public revenues of the nation. This peculiar system of tax-gathering dates from an ancient period. For each class of imposts there was a special administrative board, presided over by one of the F. G. or by one of his assistants. At first, the leasing of the public revenues was based on the competitive system, and determined by the estimates handed in; but latterly, every formality, every preliminary guarantee of this nature disappeared, and the leasing depended wholly on the favor or jobbery of the govt. officials. The minister of finance selected the F. G. at his pleasure, but his choice was always regulated by the present, or rather bribe (*pot-de-vin*) offered to him; which, we may presume, was never inconsiderable, inasmuch as its value was fixed by the minister himself. Generally, shares in the concern were assigned by the king to his favorites, male and female. The number of F. G. was ordinarily 40, but shortly before the Revolution it had risen to 60. The lease was signed by a salaried deputy, responsible to the king alone. The king occupied the position of a creditor toward the F. G., and could coerce them into payment of the stipulated sum as a just debt; the F. G., on the other hand, occupied a similar position toward their subordinates. The entire sum necessary to place in the national treasury—in other words, the annual national revenues—amounted to 180 millions of livres (now francs). The rest was outrageous extortion, for we are certainly within the mark in estimating it at seven millions of livres. The powers, rights, and duties of the F. G. were defined by special decrees; but however severe may have been the fiscal laws against fraud and contraband, it is notorious that, shortly before the Revolution, abuses of the most flagrant description had demoralized the system and the men. The consequence was inevitable. During the Revolution, most of these odious tax-gatherers perished on the scaffold, the comparatively innocent among them occasionally confounded with the guilty. Even the virtues and the learning of the illustrious Lavoisier could not save him.—Farmers of the revenue are an institution of ancient origin. The Roman *publicani* (q.v.) were officers of this kind; and duties of various kinds were at one time farmed in Great Britain: see EXCISE.

FARMING'S ISLAND—FARNESE.

FARMING'S ISLAND: island in the n. Pacific Ocean, n. of the Sandwich Islands; lat. 30° 49' n., and long 159° 20' w.; it was formally taken possession of, for the queen of England, 1861, Feb. 8, by her majesty's steamer *Albert*. The harbor was called English Harbor, and a point, on which there is a settlement, was termed English Point.

FARMINGTON, *fārm'ing-ton*: village of Hartford co., Conn.; on the F. river and the New Haven and Northampton railroad; 10 m. w.s.w. of Hartford, 31 m. n. of New Haven. This attractive village contains 7 churches, savings bank, money-order post-office, and several manufactories. Here for many years has been one of the most distinguished schools in the country for young ladies—an institution noted for scholarship, and for refinement. The American Board of Foreign Missions, earliest missionary soc. in the United States, was organized in F.—Pop of tp. (1870) 2,616; (1880) 3,017; (1890) 3,179.

FARMINGTON: village, cap. of Franklin co., Me.; on the Sandy river; n. terminus of the Androscoggin div. of the Me. Central railroad; 36 m. n.w. of Augusta, 54 m. n. of Lewiston, 80 m. n.e. of Portland. F. is noted as an educational centre, having a state normal school, the Abbott Family School for Boys, the Wendell Institute for Girls, high school, and a number of superior graded schools. It contains a court-house, 6 churches, 1 national bank, 1 savings bank, 2 machine shops, several flour and saw mills, corn-canning factories, carriage, boot and shoe, and wood-novelty factories; and valuable slate quarries.—Pop. tp. (1870) 3,251; (1880) 3,353; (1890) 3,207.

FARNE, *fārn* (or **FEARNE**, or **FERN**, *fērn*) **ISLES** (or the **STAPLES**): group of 17 islets and rocks, some visible only at low tide, two to five m. off the n.e. coast of Northumberland, England, opposite Bamborough. On one of the isles is the tower of a priory, built to the memory of St. Cuthbert, who spent the last two years of his life here. There is a hole called the churn, through which the sea rises. The passage among the isles is very dangerous in rough weather. Two of the islets have each a light-house. Here the *Forfarshire* was wrecked 1838 (see **DARLING**, **GRACE**); and here, 1843, the *Pegasus* met the same fate, and 60 persons were drowned.

FARNESE, *fār-nēz'*, It. *fār-nū'zā*: illustrious family in Italy, whose origin can be traced to the middle of the 13th c., when it possessed the castle of Farneto, near Orvieto. Many of its members have filled the highest offices in the church.—In 1534, Cardinal **ALESSANDRO FARNESE** was raised to the papal see under the title of Pope Paul III. (q.v.), and as his great aim was the aggrandizement of his family, he erected Parma and Piacenza into a duchy, which he bestowed on his natural son, Pietro.—**PIETRO LUIGI FARNESE** was one of the most dissolute men of his period, and after many tyrannical attempts to limit the privileges of the nobles, he was assassinated 1547, Sep. 10.—He was succeeded by his son **OTTAVIO FARNESE** (1520–85), who married a natural daughter of Charles V., and

FARNESE.

whose reign was marked by unbroken peace, and by various efforts made for the good of his subjects.

ALESSANDRO FARNESE (1546-92), son of Ottavio F., served his first campaign under his uncle, Don John of Austria, and distinguished himself at the battle of Lepanto, 1571. He afterward followed his mother into the Low Countries, then in insurrection, and aided in the victory at Gembloux, 1578, Jan. 31. He was made gov. of the Spanish Netherlands by Philip II., and carried on the war against the Prince of Orange. The ill success of the expedition against England, to the command of which he had been appointed by Philip II., grieved him the more from its contrast to his former successes. On his return to the Netherlands, he was appointed commander-in-chief of the army dispatched to the assistance of the Rom. Catholics in France, and compelled Henry IV. to raise the siege of Paris. Being, however, ill supplied with provisions and money by Philip, and insufficiently supported by the League, he was forced to yield to the superior power of Henry IV., and died soon afterward at Arras. He was really an able warrior, and though severe in his discipline, was almost worshipped by his soldiery.—RANUCCIO FARNESE (d. 1622), son and successor of Alessandro F., had not the brilliant qualities of his father: he was sombre, austere, greedy, and proud. A conspiracy was hatched against him, and Ranuccio was seized, and thrown into prison.—ODOARDO FARNESE (1612-46), natural son of the preceding, was a prince remarkable for the elegance of his manners, also, according to Muratori, for his magnificence, magnanimity, and liberality.—The family became extinct in the person of ANTONIO FARNESE (d. 1731).

The name of the F. family has been bestowed on several celebrated works of art. These are—1. The *Farnese Palace* at Rome, built by Pope Paul III., before his accession to the holy see, after the design of Antonio da San Gallo. It is in the form of a quadrangle, and was completed by Michael Angelo. The palace is one of the finest in Rome. The antique sculptures for which it was formerly renowned are now in the Museum at Naples; a few classic works, however, remain in the great hall. The gallery contains the frescoes of Annibal Caracci, which are very valuable, as exhibiting in the most complete manner the new line of art which he struck out. In a room adjoining the gallery, are some mythological fresco-paintings by Domenichino. 2. The *Farnesina*, a very elegant palace in Trastevere. It owes its celebrity chiefly to the frescoes of Raphael; but it contains frescoes also by Peruzzi, Sebastian del Piombo, and a colossal head in *chiaroscuro*, attributed to Michael Angelo. Among the antiques, formerly belonging to the F. family, now in the museum at Naples, are two which still bear the name of their original owners. 3. The *Farnese Bull*, a colossal group attributed to Appollonius and Tauriscus of Tralles, in Asia Minor, who probably belonged to the Rhodian school, and lived about B.C. 300. The group represents Dirce bound to the horns of a bull by Zethus and Amphion, for ill usage of her mother—a

FARNESS—FARO.

subject which, notwithstanding the vigorous treatment, is on the whole unsatisfactory. Pliny mentions the transference of the group to Rome, where it first adorned the library of Asinius Pollio, and afterward the Baths of Caracalla. It was discovered anew in 1546, restored by Bianchi, and placed in the Farnese Palace. 4. *The Farnese Hercules*, copied by Glykon from an original by Lysippus. It exhibits the hero, exhausted by toil, leaning upon his club; the muscles and veins are still swollen, the head inclined, the expression melancholy; one hand rests upon his back, and grasps one of the apples of the Hesperides.

FARNESS: see under **FAR**.

FARNHAM, *fārn'am*: town in the w. of Surrey, England, on the left bank of the Wey, 10 m. w.s.w. of Guildford. It consists chiefly of one street running e. and west. The principal feature is the stately old castle of the bishops of Winchester, built first by Bishop de Blois, brother of King Stephen. The castle was razed by Henry III., rebuilt and garrisoned by Charles I., and restored, 1684, to its present state by Bp. Morley. It is an embattled quadrangle of brick, covered with stucco. A new town-hall was erected 1866. F. has belonged to the bishops of Winchester since 860, when Ethelbald of Wessex bestowed it on them. Some parts of the parish church were built in the 12th, 15th, and 16th c. The chief trade is in hops, a very fine variety of which is grown in the vicinity. William Cobbett was born and is buried here. Aldersholt Camp (q.v.) is about 6 m. n. of F.—Pop. (1891) 5,545.

FARNOVIANS, n. *fār-nō'vī-anz* [from *Farnovius*, latinized name of Stanislaus Farnowski]: in *eccles.* and *chh. hist.*, Polish Unitarian sect, which, under the leadership of Farnowski, separated from the rest of the Unitarian body 1568, and continued till their chief's death 1615.

FARNWORTH, *fārn'wérth*: town of Lancashire, England; two miles and a half s.e. from Bolton-le-Moors, near the Tonge, a branch of the Irwell. It is a station on the Manchester and Bolton railway. It has a picturesque embattled chapel of the 15th c. The town is thriving, and there are manufactures of sail-canvas, watches, files, etc. Pop. (1871) 13,723; (1881) 19,380; (1891) 23,758.

FARO, or **PHARO**, n. *fār'ō* [It.]: game at cards of the nature of Hazard (q.v.), in evil repute as played chiefly for gambling purposes. **FARO-BANK**, n. bank or deposit of money against which the players play in the game of faro; gambling-house or room. See Hoyle's *Games*.

FARO, *fā'rō*: pleasant and wealthy episcopal city of Portugal, cap. of the province of Algarve; in a plain at the mouth of the Fermoso, lat. 37° n., and long. 7° 52' w. It has, on the whole, a modern aspect, but its houses are not handsome, and its streets are in general narrow. It is surrounded with walls said to have been built by the Moors. The harbor of F. is somewhat confined, but the roadstead formed by three islands at the mouth of the river affords good anchorage. F. has considerable exports of oranges, figs, anchovies, and cork. It has also a prosperous fishery.

FARÖE ISLES—FARQUHAR.

The number of blind people here is surprising, groups of five and six together being frequently observed. This is accounted for by the light sandy soil.—Pop. 8,671.

FARÖE ISLES, *fä'rö* or *fä'rö'é* [Dan. *Faar-Oen*, sheep-islands]: a group of islands, 22 in number, only 17 inhabited; belonging to Demark, lying nearly midway between the Shetlands and Iceland, $61^{\circ} 25'$ — $62^{\circ} 25'$ n. lat., and 6° — 8° w. long. The principal island, Stromoe (cap. Thorshavn), is 27 m. long, and 8 m. broad; those next in importance are Osteroe, Vaagoe, Bordoe, and Sudaroe; entire area nearly 500 sq. m. The F. I. consists of basaltic elevation, none of which attain a height of 3,000 ft., and trap formations, covered with a thin vegetable soil, which yields pasturage to the cattle and numerous sheep. There are no considerable valleys or streams, but small fresh-water lakes are numerous. The coasts which are steep and lofty, are broken by deep inlets, and there are whirlpools and rapids which render navigation perilous. The furious winds which prevail prevent the growth of trees, or even of most of the ordinary vegetables and cereals; but the climate is so greatly modified by oceanic influences that notwithstanding the high latitude, snow rarely lies long on the ground, and the cattle can pass the greater part of the year in the open air. Peat and coal are used for fuel; traces of iron and copper, and opal, chalcedony, etc., are found. The chief sources of wealth are flocks of sheep, and multitudes of sea-fowl which frequent the rocks. The Islanders are skilful in climbing the dangerous cliffs in search of birds, and they are expert in fishing for seals and whales. Their manufactures are of the homeliest kind, but in return for the numerous articles supplied to them by the mother-country, they yield tallow, train-oil, feathers, skins, and butter to the Danish markets. The people are of Norwegian origin, a vigorous, laborious, loyal, and religious race, and belong to the Lutheran Church. They are governed by a Danish *amtmand*, or bailiff, and a landvogt, or director of the police and municipal departments, and are represented in the Danish legislature by a deputy appointed by the king. The islands were discovered in the 9th c. by Norwegians, and have belonged to Demark since the incorporation of Norway with that kingdom by the Union of Calmar; and the language of the people is only a slightly modified form of the Old Norse. England held the islands from 1127 to the treaty of Vienna, in 1814. Some account of the Isles will be found in Prof. Sir Wyville Thomson's book, *The Depths of the Sea* (Macmillan & Co. 1873).—Pop. (1890) 12,954.

FARÖESE, n. *fä'rö-ëz*: the language spoken in the Faroe Islands.

FAROLITE, n. *fä'rö-lit* [from the *Faroe Isles*]: a mineral of a pearly lustre, and a whitish or bluish color.

FARQUHAR, *fär'kwär* or *fär'kér*, GEORGE: 1678–1707; b. Londonderry, Ireland. He received his education at the Dublin Univ., where, though he did not take any degree, he secured the reputation of a wit who was a spendthrift of

FARR.

his witticisms. When he left the univ., he was engaged as an actor by one of the Dublin theatres, but, like most dramatists who have figured on the stage, he proved but an indifferent performer. Playing a part in Dryden's *Indian Emperor*, and forgetting that he wore a sword instead of a foil, he accidentally wounded a brother performer, and was so shocked by the occurrence that he at once quitted the boards. Accompanied by the actor Wilks, he went to London, and soon received a commission to the regt. commanded by the Earl of Orrery, then stationed in Ireland. Urged by Wilks, and perhaps stimulated by the gayety and leisure of a military life, he, 1698, produced his first comedy, *Love and a Bottle*, which proved a success. Two years afterward, his *Constant Couple* appeared, which had a brilliant reception, and to which he wrote a sequel, *Sir Harry Wildair*. In 1703, he produced *The Inconstant*, founded on the *Wildgoose Chase* of Beaumont and Fletcher, a version in which all the coarseness, and none of the poetry, of the elder dramatists is retained. He married in the same year, and falling into serious pecuniary difficulties, he sold his commission, and, struggling with adverse fortune, succumbed, and died of decline, leaving 'two helpless girls' to the care of his friend Wilks. During his last illness, he wrote the best of his plays, *The Beaux Stratagem*—in six weeks, it is said—and died while its wit and invention were making the town roar with delight.

F. is one of the finest of comic dramatists, though Pope calls him a 'farce writer.' He is less icily brilliant than Congreve, and has on the whole more variety and character than any of his compeers. He had wit in abundance, but he had humanity too. He was tender-hearted and somewhat melancholy, and—what was rare in his school and in his time—tears are found glittering among the brilliants of his fancy.

FARR, *fâr*, WILLIAM, M.D., F.R.S.: 1807, Nov. 30—1883, Apr. 14; b. Kenley, in Shropshire, England: statistician. He became an asst.-surgeon at the Salop Infirmary 1826, and after attending privately the medical and scientific classes of the day, went to Paris Univ. 1829, where he attended the lectures of the most eminent medical professors. In 1831, he returned to England, and became a member of the Univ. of London, where he completed his professional curriculum. F. applied himself mainly to a consideration of the important questions resulting from medical statistics. At first he found it very difficult to draw the attention either of the public or of medical societies to the subject; but in 1837, his article, 'Vital Statistics,' in M'Culloch's *Statistics of the British Empire*, obtained notice and approval. In the same year, the registration of all the deaths, and of the causes of death, was begun in England, and 1838, F. received an appointment in the gen. registrar's office. He was made supt. of a department which draws up the *London Tables of Mortality*, the *Quarterly Returns of Births, Deaths, and Marriages*, and the *Annual Abstracts*. In 1851, 61, and 71, he was engaged on the census. In 1872 he was chosen a corresponding

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member of the French Institute. In 1880, on the appointment of a new registrar-gen., F. (who was a C. B.) withdrew from the public service. He wrote a *Statistical Nology*, and valuable papers on Life Assurance, the Income Tax, etc. His *Vital Statistics*, a memorial volume appeared 1885.

FARRAGO, n. *fār-rā'gō* [L. *farrāgō*, mixed food for cattle—from *far*, meal or flour]: a mixture of meal and other food for cattle; a confused mixture; a medley.

FARRAGUT, *fār'a-güt*, DAVID GLASCOE: first admiral, U. S. navy: 1801, July 5—1870, Aug. 14; b. Campbell's Station, Tenn.; son of a Spaniard who had served as officer on an American vessel in the Revolution. He was appointed midshipman in the navy and ordered to the *Essex* under Capt. Porter 1810, Dec. 10; had his first war experience when 12 years old, when as prize master he took a captured vessel to Valparaiso, and performed his first battle service in the engagement of the *Essex* with the *Phæbe* and *Cherub* in Valparaiso harbor, 1814, Mar. 28. He was commissioned lieut. 1825, commander 1841, capt. 1855. In 1861, Apr., he volunteered for active service, but it was not till the following year that he was congenially employed. In 1862, Jan., the govt. fitted out an expedition for the capture of New Orleans, placed him in command of the naval fleet, and assigned a force of 15,000 men under Gen. B. F. Butler to co-operate with him. Choosing the sloop-of-war *Hartford* for his flagship, he sailed from Hampton Roads Feb. 2 for Ship Island, 100 m. n. e. of the mouth of the Mississippi, and there awaited the land force which left Fortress Monroe in transports Feb. 20. New Orleans was then defended against attack from the Gulf by Forts Jackson and St. Philip, 70 m. below the city, and by numerous gunboats, steam-rams, and fire-rafts. F. began bombarding Fort Jackson, Apr. 18, and, seeing no prospect of reducing it after a heavy fire of 6 hours, determined to attempt to reach the city by sailing past the two forts in the darkness. Shortly before daylight on Apr. 24, he ordered a general advance of the fleet. Both forts, the gunboats, and the iron-clad ram *Manassas* opened fire upon his vessels as they sped up the river, and the fire-rafts were ignited and directed down stream to oppose the advance. Of the fleet of 17 vessels, 13 passed the forts safely and destroyed the Confederate gunboats above as well as the *Manassas*. The *Brooklyn* silenced Fort St. Philip in passing. The action lasted 1½ hours, and caused a Union loss of 36 killed and 135 wounded. The city was occupied on the 24th, the forts surrendered to Com. Porter 28th, and F. turned over the command of the city to Gen. Butler upon his arrival with the army May 1. F. then desired to attack Mobile the same way, but the govt., anxious to open the Mississippi river its entire length, ordered him to co-operate with Gen. Grant in the campaign against Vicksburg. On June 28 he ran past the fortifications at that point, joined the Union iron-clad fleet above, and finding no army support at hand, repassed

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Vicksburg and returned to New Orleans. In these movements he was under fire 2 hours and lost 15 killed and 30 wounded. He was commissioned rear-admiral 1862, July 16. On 1863, Mar. 14, he attempted to send a fleet of 3 sloops-of-war and 3 gunboats lashed together and a side-wheel steamer past the Port Hudson batteries, but only one pair of vessels, the flagship and its consort, got through the fearful fire. On May 24 the combined naval fleets under F., with the army under Gen. Grant, began operations against Port Hudson, and after its fall, July 9, F. sailed in his famous flagship for New York, where he rested 5 months while the vessel was undergoing repairs. In 1864, Jan., he returned to the Gulf, and began planning his long cherished attack on Mobile. On Aug. 5, with a fleet of 14 wooden vessels and gunboats and 4 iron-clad monitors, he passed Forts Morgan and Gaines as he had Forts Jackson and St. Philip, though with greater obstructions from submerged chains and torpedoes, and took possession of the bay, with a loss of 52 killed and 113 drowned. Fort Powell was blown up the next day, Forts Morgan and Gaines surrendered to the army a few days later, but the city was not occupied till 1865, Apr. 12, F. then returned home to recuperate his health. Congress created and gave him the grade of vice-admiral, 1864, Dec.; and created for him that of admiral, 1864, July 25; citizens of New York presented him a purse of \$50,000; and swords of honor, public receptions, and banquets were freely tendered him. In 1867 he took command of the European squadron and made a notable cruise; in 1870, Jan., performed his last naval service as commander of the fleet which received the remains of George Peabody in Portland harbor, Me. F. has a place among the most brilliant naval commanders. He was as modest as he was brave.

FARRAKHÁBÁD: see **FURRUCKABAD**.

FARRANT, a. *fär'ränt*: in *Scot.*, sagacious. **FAR'RAND**, a. in *OE.*, deep; cunning.

FARRANT, *fär'ant*, **RICHARD**: abt. 1530–81: composer of English church music. He was a gentleman of the Chapel Royal in the reign of Edward VI., and resigned on becoming master of the children of St. George's Chapel, Windsor, 1564. In 1568 he presented a play before the queen at Shrovetide, and on Christmas, 1569, was reappointed to the Chapel Royal, and later became a clerk and organist of St. George's Chapel. His compositions include *Call to Remembrance*, *Hide Not Thou Thy Face*, and according to some authorities, *Lord, for Thy Tender Mercies' Sake*.

FARRAR, *fär'ér*, **FREDERIC WILLIAM**, D.D., F.R.S.: Archdeacon of Westminster, England: b. Bombay, India, 1831, Aug. 7. He was educated at King William's College, Isle of Man, and King's College, London, and graduated at the Univ. of London 1850 and at Cambridge Univ. 1854. While a student he gained the chancellor's prize for English verse by his poem on *The Arctic Regions*, and Le Bas classical prize, and also became Norrisian prizeman. He

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was ordained deacon in the Established Church 1854, and admitted into priest's orders 1857; was appointed asst.-master at Harrow 1855; and was head master of Marlborough College 1871, Jan.—1876, Apr. In 1868, 74, 75, he was a select preacher before Cambridge Univ.; 1870 he preached the Hulsean lectures; 1869-73 was honorary chaplain to the queen; 1873 was appointed one of her chaplains in ordinary; 1876 became a canon of Westminster Abbey and rector of St. Margaret's; and 1883, Apr. 24, was appointed Archdeacon of Westminster. He was appointed Bampton lecturer before Oxford Univ., 1885, and the same year delivered a eulogy on Gen. Grant in the Abbey Aug. 4, and began a lecturing tour of the United States, Oct. F. has contributed to Smith's *Dictionary of the Bible*, Kitto's *Biblical Cyclopedia*, and the *Encyclopædia Britannica*; and published among numerous works *Eric* (1858); *Julian Home* (1859); *St. Winifred's* (1863); *The Origin of Language* (1860); *Chapters on Language* (1865); *Greek Grammar Rules* (1865); *Greek Syntax* (1867); *Families of Speech* (1870); *Language and Languages* (1878); *Seekers after God* (1869); *The Witness of History to Christ* (1871); *The Silence and Voices of God* (1873); *The Life of Christ*, 2 vols. (1874) an exceedingly interesting and popular work; *Life and Works of St. Paul*, 2 vols. (1879); and *The Early Days of Christianity*, 2 vols. (1882); *Eternal Hope*, a fervent and glowing treatise on eschatology, which has met some adverse criticism from adherents of the old doctrines as enfeebling the doctrine of eternal retribution.

FARRAR, JOHN, LL.D.: 1779, July 1—1853, May 8; b. Lincoln, Mass.: mathematician. He graduated at Harvard Univ. 1803, studied theol. in Andover Seminary, became Greek tutor at Harvard 1805 and Hollis prof. of mathematics and natural philosophy 1807, and held the latter chair till 1836. In 1818 he translated La Croix's *Elements of Algebra*, which at once became a text-book in the chief educational institutions of the country; and followed it with selections from Legendre, Biot, Bezant, and other mathematicians.—His second wife, ELIZA WARE F. (1791-1870, Apr. 22; b. Flanders, Europe, dau. of Benjamin Rotch, New Bedford, Mass.), wrote *Children's Robinson Crusoe*, *The Story of Lafayette*, *The Story of Howard*, *Youth's Love Letters*, *Young Lady's Friend*, *Congo in Search of His Master*, and *Recollections of Seventy Years*.

FARRAR, TIMOTHY, LL.D.: 1747, July 11—1849, Feb. 21; b. Concord, Mass.: lawyer. He graduated at Harvard Univ. 1767; removed to New Ipswich, N. H., and taught school 1770; served in the revolutionary war and attained the rank of maj.; was appointed a justice of the N. H. court of common pleas after the war; became chief justice 1802, Feb.; and served altogether as judge over 40 years.—His son, TIMOTHY F., was law-partner of Daniel Webster, judge of the N. H. court of common pleas, and author of several legal works and reports.

FARREN, *fär'en*, ELIZA, Countess of Derby: 1759-1829, Apr. 23; b. Liverpool: actress. She was daughter of an

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Irish surgeon who became an actor; made her first appearance on the stage at Liverpool 1773, and at London 1777, and married the 12th earl of Derby, 1797, May 1. She was a graceful actress, and a woman of rare beauty and estimable character.

FARRIER, *n.* *fär'ri-ër* [It. *ferrāiā*, a smithy: *F. ferrer*, to shoe a horse: *L. ferrārius*, pert. to iron—from *ferrum*, iron]: a shoer of horses; a horse doctor. Some of the better class of farriers are men of shrewdness and observation, and sometimes considerable experience. Their management of sick horses is occasionally sensible, but generally quite empirical. They have usually but crude ideas of the structure, functions, or diseases of animals, and pin their faith mainly on a few carefully cherished recipes. To their calling as horse-doctors and shoeing smiths (see HORSE-SHOEING), they usually unite those of cow-leech and cutter of colts and pigs. Though still found in some rural districts, especially in England and Ireland, their practice is passing into the hands of regularly educated veterinarians: see VETERINARY MEDICINE. **FARRIER**, *n.* *-ër-ē*, the place of business of a farrier; the trade or profession. **ARMY-FARRIERS** (Farriers-major, and farriers) non-commissioned officers in the cavalry, artillery, engineers, and military train, whose duty it is to shoe the horses of their corps, and, generally, to assist the veterinary surgeon in proper care over the regimental animals. They receive the same pay as other sergeants (with whom they rank); and, in addition, certain allowances proportionate to the number of animals in charge.

FARROW, *n.* *fär'rō* [AS. *fearh*, a little pig: O.H.G. *farah*, a pig: Sw. *farre*, a boar: Dan. *fare*, to farrow]: a litter of pigs: *V.* to bring forth pigs. **FARROWING**, *imp.* **FARROWED**, *pp.* *-rōd*. **FARROW**, *a.* [D. *vaarkoe*, *vaars*, a heifer or young cow that has not yet brought forth a calf]: applied to cows not bearing young in a given year or season.

FARS, *fārs*, or **FARSISTAN**, *fār-sis-tān'*, (anc. *Persis*): province of Persia, on the e. shore of the Persian Gulf, between lat. 27° 30' and 31° 30' n., and between long. 49° 30' and 55° e. The coast region is flat, with a hot climate; inland, the ground rises 2,000 to 3,000 ft., the climate is cooler, and valleys, remarkable for beauty and fertility, ranging from 15 to 100 m. in length, are numerous. E. of this hilly district the province again becomes flat and sandy; and here is the large salt-lake Bakhtegan. The chief rivers are the Bundemeer (anc. Araxes), the Nabon, and the Tab (anc. Arosis). The province produces tobacco, wine, rice, dates, opium, linen, cotton, silk, cochineal, and roses for the manufacture of attar. It has iron and lead mines, marble and alabaster quarries, and yields also borax and naphtha. It trades mainly with India. The principal towns are—Shiraz, Jehroom, Darab or Darabgerd, Behbahan or Babahan, and Bushire. N. of Shiraz, about 30 m. lie the ruins of the ancient and splendid city of Persepolis. *F.* contains also the remains of Shahpur, a city older than the age of Alexander the Great, and the celebrated sculptured

FARSAN ARCHIPELAGO—FASCES.

rocks, called by the Persians *Naksh-i-Rustam*. A cold winter and heavy floods, 1873, 4, caused great damage to property; nearly one-third of the city of Shiraz was destroyed by the floods.

FARSAN ARCHIPELAGO, *fâr-sân'*: group of islands in the s. e. of the Red Sea, the chief of which are Farsan Kebeer, 31 m. long. and Farsan Seggeer 18 m.; lat. 16° 30'—17° n., and long. 41° 45'—42° 10' e. They would be valuable for harbors, were it not for the reefs in the vicinity.

FARTHER, a. *fâr'thër*, or **FURTHER**, a. *fër'thër* [from *far* (see **FURTHER**)]: comp. of *far*; more distant or remote; longer: AD. more remotely; at or to a greater distance: CONJ. moreover; more than that. Superl. **FARTHEST**, or **FURTHEST**. *Note*.—**FARTHER** is applied to physical distance—**FURTHER**, refers to the progress of an argument or inference: the older forms are *fer*, *ferre*, *ferrer*, the *th* being corruptly inserted.

FARTHING, n. *fâr'thîng* [AS. *feorthling*, the fourth part of a coin—from *feorth*, fourth]: a small copper coin, the fourth part of a penny (q.v.).

FARTHINGALE, n. *fâr'thîng-gâl* [old form of the word, found in Bp. Latimer; OF. *vertugade* and *verdugalle*; Sp. *verdugado*, a hooped petticoat—from Sp. *verdugo*, a rod or shoot of a tree]: a circle of whalebone formerly in use to spread a woman's petticoat to a wide circumference; a crinoline petticoat: see **CRINOLINE**.

FAR'YNDON INN: name formerly borne by Serjeants' Inn, Chancery Lane. This building belonged to the bishops of Ely, by whom, 1411, it was let to the serjeants-at-law. In 1484, the name was changed to Serjeants' Inn (q.v.).

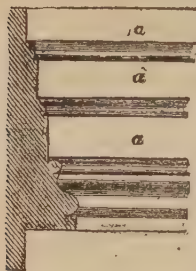
FASANO, *fâ-sâ'nô*: town of Italy, province of Bari, 33 m. s. e. of the town of Bari; on the high road from that town to Brindisi. It is small, but wealthy. The whole of the district of F. abounds in olive plantations, and there are numerous oil-presses in the town and neighborhood. Pop. (1881) 13,950.

FASCES, n. plu. *fâs'sêz* [L. *fascēs*, a bundle of rods: It. *fascio*]: bundles of rods usually of birch, sometimes of elm, with an ax projecting from the middle of them, which were carried before the chief magistrates of anc. Rome, as symbols of their power over life and limb. They were borne by the lictors, at first before the kings; in the time of the republic, before consuls and pretors; and afterward before the emperors. Their number varied, a consul having twelve, and a pretor, six; but within the city only two. Valerius Publicola introduced a law that within the city the ax was withdrawn, except in the case of a dictator, who was preceded by twenty-four lictors, bearing as many fasces. Publicola also caused the fasces to be lowered at the assemblies of the people, as an acknowledgment of their supreme power. **FAS'CIAL**, a. *-si-âl*, pert. to the fasces.

FASCET—FASCINATION BY SERPENTS.

FASCET, n. *fās'ēt* [L. *fascis*, a bundle]: in *glass-working*, iron-wire basket on the end of a rod, to carry the bottle from the blowing-rod or the mold to the leer; called also a *pontee*.

FASCIA, n. *fāsh'ĭ-ă*, **FAS'CIÆ**, n. plu. *-ĭ-ē* [L. *fāsciū*, a bandage, a swathe; *fāsciculŭs*, a small bundle: It. *fascicolo*: F. *fascicule*]: in *arch.*, a flat space or band, like a broad ribbon, usually between moldings on the architrave. Architraves are called single, double, or triple fasciæ architraves, according to the number of fasciæ into which they are di-



Fasciæ.

vided. Also, a fillet; a surgical bandage; in *anat.*, a membranous expansion of connective tissue. **FASCIALIS**, n. *fās-sĭ-ă'lis* or *fāsh'ĭ-ă'lis*, in *anat.*, long, small, and flattened muscle at the anterior part of the thigh; called also sartorius. **FASCIATED**, a. *fāsh'ĭ-ă-tĕd*, bound with a bandage. **FAS'CIA'-TION**, n. *-ă'shĭn*, in *bot.*, the union of branches or stems, presenting a flattened ribbon-like form; in *anat.*, act or manner of binding diseased parts. **FASCICLE**, n. *fās'sĭ-kl*, a little bunch; a cluster; in *anat.*, a bundle of muscular fibres. **FASCICLED**, a. *fās'sĭ-kld*, or

FASCICULATE, a. *fā-sĭk'ū-lăt*, in *bot.*, collected, as it were, into a little bundle. **FASCIC'ULAR**, a. *-ŭ-lĕr*, united or growing together in bundles or tufts. **FASCICULARIA**, n. *fās-sĭk'ŭ-lĕr'ĭ-a*, in *zool.*, a genus of fossil polyzoa, occurring in the Tertiary rocks.

FASCINATE, v. *fās'sĭ-năt* [L. *fāscinātus*, enchanted, bewitched: F. *fasciner*, to fascinate: comp. Gr. *baskainein*, to bewitch; Gael. *fāisniche*, a prophet]: to enchant; to charm; to captivate; to allure by some powerful influence. **FAS'GINATING**, imp.: **ADJ.** charming; enchanting. **FAS'GINATED**, pp. **FAS'GINA'TION**, n. *-nă'shĭn* [F.—L.]: the act of captivating; a powerful influence over the affections or passions; an unseen and inexplicable influence.—**SYN.** of 'fascinate': to enrapture; enslave; bewitch.

FASCINATION BY SERPENTS: power long popularly ascribed to serpents, at least to some kinds of them, of fascinating by their eye the small animals on which they prey, so as to prevent the escape of the intended victim, when its escape would otherwise be easy, and to cause it rather to run or flutter into the mouth which is open to devour it. This popular notion has been ridiculed, but is supported by a large amount of evidence, and has been fully adopted by some most scientific observers. In the earlier part of last century, Kalm described the rattlesnake as frequently lying at the bottom of a tree, on which a squirrel is seated, and fixing its eyes on the little animal, which from that moment cannot escape, but begins a doleful outcry, comes toward the snake, runs a little away, comes nearer, and finally is swallowed. Le Vaillant describes a similar scene, witnessed by him in Africa, a shrike incapable of moving

FASCINE—FASH.

away from a serpent which was gazing fixedly at it, and dying of fear, though the serpent was killed. Dr. Andrew Smith states that the presence of a non-venomous s. African tree-snake, *Bucephalus viridis*, in a tree, causes the birds of the neighborhood to collect around it and fly to and fro, uttering piercing cries, 'until some one, more terror-struck than the rest, actually scans its lips, and almost without resistance, becomes a meal for its enemy.' He adds, 'whatever may be said in ridicule of fascination, it is nevertheless true that birds, and even quadrupeds, are, under certain circumstances, unable to retire from the presence of certain of their enemies; and what is even more extraordinary, unable to resist the propensity to advance from a situation of actual safety, into one of most imminent danger. This I have often seen exemplified in the case of birds and snakes; and I have heard of instances equally curious, in which antelopes and other quadrupeds have been so bewildered by the sudden appearance of crocodiles, and by the grimaces and contortions they practiced, as to be unable to fly, or even move from the spot toward which they were approaching to seize them.' Ellis, in his *Three Visits to Madagascar*, records anecdotes of the same kind; one in particular, of a frog apparently unable to move, until an object was pushed between it and the eye of the snake, when the frog immediately darted away, as if relieved from some mesmeric influence.

FASCINE, n. *fäs-sën'* or *fäs'sën* [F. *fascine*, a hurdle, a fascine—from mid. L. *fascīna*, a bundle of wood]: fagots for military purposes, made of young branches of trees or brushwood, also of osiers, bound together with yarn or withes. They are about 12 inches in diameter, and of various lengths, averaging 12 ft., according to the object for which they are intended. Fascines are used in the construction of temporary works, to make earth stand at a slope steeper than it would assume naturally; for filling a ditch, and sometimes, in a pile, for setting fire to an obstruction. Before a siege, the soldiers are employed in making fascines in great number; and when needed, each soldier bears one to the place, casts it on the heap, and the quantity required is thus accumulated in a remarkably short time.

FASCIOLA, *fäs-sī-ō'la*: generic name formerly denoting all the *Trematode Entozoa*, as Flukes, etc., which are now divided into many genera.

FASCIOLARIA, n. *fäs-sī-o-lär'ī-a* [L. *fasciola*, a band-age]: in *zool.*, genus of gasteropodous mollusks, belonging to the family *Muricidae*. They occur in warm and southern seas; in *paleon.*, fasciolaria commence their existence in the Cretaceous rocks.

FASH, v. *fäsh* [OF. *fascher*; F. *fächer*, to vex, to tease]: *Scot.*, to trouble; to vex; to tease: N. trouble; vexation. **FASH'EOUS**, a. -us, troublesome. **FASH'ING**, imp. **FASHED**, pp. *fäsht*. To **FASH ONE'S THUMB**, to give one's self trouble, said to be in allusion to the use of the thumb in making a bargain.

FASHION.

FASHION, n. *făsh'ăn* [F. *façon*, the form or make of a thing; OF. *faceon*, form, shape—from L. *factiōnem*, a making or doing; comp. Gael. *fasan*, the fashion]: the make or form of anything: the prevailing mode or form of dress; the mode or style usual among persons of good breeding; custom; general practice; in *OE.*, a spelling for *Farcy*, which see: V. to mold; to shape; to make; to form; in *OE.*, to counterfeit. **FASH'IONING**, imp. **FASH'IONED**, pp. *-ănd*. **FASH'IONER**, n. one who. **FASH'IONABLE**, a. *-ă-n-ă-bl*, according to the established mode; prevailing at a particular time; dressing or behaving according to the usages of good society; well-bred. **FASH'IONABLENESS**, n. *-bl-nēs*. **FASH'IONABLY**, ad. *-ă-blĭ*. **FASH'IONABLES**, n. plu. *-ă-blz*, persons of fashion. **FASHION-MONGER**, *-măng-ger* [see **MONGER**]: in *OE.*, one who makes fashions an engrossing study.—**SYN.** of 'fashion, n.': manner; method; practice; habit; usage; make; form; style; shape; appearance; mode; pattern; model; workmanship; execution; sort; way;—'fashion, v.': to figure; fit; adapt; accommodate.

FASHION, in clothing, or, as the French term it, *La Mode*: prevailing style of dress. It admits as little of exact definition as of being referred to any intelligible principle. In every age and country, there has been a recognizable costume or general style of male and female attire, with certain niceties in the shape, color, and texture of dress, which, fluctuating according to taste or whim, are known as the fashion—a word which etymologically signifies making in a particular form. The terms fashion and fashionable are, however, so comprehensive as to include much beyond the sphere of the toilet; as, for example, a style of speaking, living, and forming opinions; there being, to use a common phrase, 'a fashion in everything.' It is only in China and some other eastern countries that, in consequence of dress being regulated by sumptuary laws or equally strict traditions, the fashions of attire remain from generation to generation with little or no change. (For the nature and necessity of clothing, see **WEAVING: SANITARY SCIENCE**).

A glance at the leading forms of dress and more conspicuous fashions that have prevailed in W. Europe, particularly in England, since the dawn of civilization, shows that modern costume seemingly had a double origin—that of the Romans and of the Teutonic people, who in different branches invaded France and Britain. The usual Roman dress, in the latter period of the Empire, consisted of a tunic, or loose upper garment, with a dress for the lower limbs, called *braccæ*; hence the modern term *breeches*. Over all was occasionally worn by the higher classes the *toga*, or mantle. It is believed that these Roman costumes were generally copied by the greater number of British, at least among the more opulent classes. In the dress of the women, however, there was but little change. They appear in two tunics, the one reaching to the ankles, the other having short sleeves, and reaching about half-way down the thigh: in other words, they resemble a round gown, or bedgown and petticoat, though the latter, distinct from a

FASHION.

body and sleeves, is not considered ancient. This tunic was called in British *gown*; hence our word *gown*, of which specimens of short dimensions are still worn by women of the humbler classes in England, Scotland, and Wales.

The Anglo-Saxon and Danish periods of English history are marked by new peculiarities in costume. Soon after the departure of the Romans, and the arrival of the Saxons in the 5th c., fashions of apparel were introduced from N. Germany, which continued with no material change for several centuries. The most important improvement in the ordinary dress of the people was the introduction of the *shirt*, a linen garment worn next the skin, for which we are indebted to the Saxon invaders. The common dress of the 8th c. consisted, as we find, of linen shirts; tunics, or a kind of surcoat; cloaks fastened on the breast or shoulders with brooches; short drawers met by hose, over which were worn bands of cloth, linen, or leather, in diagonal crossings. Leathern sandals were worn by the early Anglo-Saxons; but afterward the shoe became common: it was very simple, and well contrived for comfort, being opened down the instep, and there, by a thong passed through holes on each side of the slit, drawn tight round the feet like a purse. A felt or woollen cap, called *hæt* (hence our modern word *hat*), was worn by the higher class of Anglo-Saxons; but it is generally believed that the serfs or lower orders were without any other covering for the head than what nature had given them. The Anglo-Saxon tunic still exists in the *smock-frock*, a species of overall worn generally by the peasantry and some farmers in England, and more rarely in the United States. The *blouse*, worn by workmen in France and Switzerland, has an equally early origin.

The Norman Conquest brought greater taste and splendor into British costume. Now were introduced gloves (q.v.), with the fashions of chivalry. The annexed engraving represents a gentleman of the reign of Henry V.: he is dressed in a short tunic, buttoned in front, with girdle, large loose sleeves, tight hose forming pantaloons, and stockings in a single piece, peaked shoes, and head-cloth or cap. About this period, silks, and velvets of divers colors came into use among the higher classes, by whom gold chains were generally worn. The dress of ladies was of the richest kind. Gowns were embroidered and bordered with furs or velvets; and the bodice, laced in front over a stomacher, now first appeared. But the greatest eccentricity was the lofty steeple head-dress, shown in the annexed portrait; this consisted of a roll of linen, covered with fine lawn, which hung to the ground, or was mostly tucked under the arms.



Gentleman of Fifteenth
Century.

FASHION.

In the 16th c., the upper part of the long hose or nether garments began to be worn loose, or slashed with pieces of different colors let in, and the arms and shoulders of the doublet or jacket were fashioned in a similar style. Boots also were worn loose on the leg, with the upper part falling down; hence the origin of the *buskin*. Ruffs or ruffles, collars, and velvet bonnets with feathers, likewise came into use, as may be seen from the paintings of Henry VIII. Hall, the chronicler, describes several of Henry's superb dresses, and among them a *frocke*, or coat of velvet, embroidered all over with gold of damask, the sleeves and breast cut and lined with cloth of gold, and tied together 'with great buttons of diamonds, rubies, and orient pearls.' The cloaks and mantles were of corresponding magnificence. The shirts were pinched or plaited, and embroidered with gold, silver, or silk. The term *hose* continued to be applied to the entire vestment, from the waist to the feet, throughout this century: the material is more distinctly stated, for Henry wore knit silk as well as cloth hose: the precise period of the separation of the hose into breeches and stockings, is not so clear as the derivation of the latter term from the '*stockying* of hose;' 'that is, adding the lower part that covered the legs and feet to that which was fastened by points to the doublet,' and was called the *stocks*. The shoes and buskins were of the German fashion, very broad at the toes, and of velvet and satin, slashed and puffed. The hats, caps, and bonnets were of almost endless forms and colors.



Lady of the Fifteenth Century.



Man and Woman of the Sixteenth Century.

The dress of the middle ranks in the reign of Henry VIII. may be seen in prints of the time; plain russet coats, and a loose kind of kersey breeches, with stockings of the same piece, were the ordinary suit; and the London apprentices wore blue cloaks in summer, and gowns of the same color in winter, as badges of servitude: for this appears to have been the age of domestic distinctions—the relics of the feudalism of the middle ages. The women wore russet, or long woolen gowns, worsted kirtles (hereafter called *petticoats*), and white caps, and aprons; and white underlinen came into general wear. The engraving shows a man and woman in the ordinary dress of this period. The principal novelty of the reigns

FASHION.

of Edward VI. and Mary was the flat round bonnet or cap, of plain velvet or cloth, worn on one side of the head, and decorated with a jewel and single ostrich feather. The bonnet itself is preserved in the caps worn at the present day by the boys of Christ's Hospital; and their blue coat and yellow stockings are such as were worn by the London apprentices at the date of the foundation of the hospital by the youthful Edward. See **HOSIERY**.

The male costume in Elizabeth's reign was the large trunk hose, long-waisted doublet, short cloak, hat, band, and feather, shoes with roses, and the large ruff; but the great breeches, 'stuffed with hair-like woollacks,' after the separation of the hose into this garment and stockings, appear to have been worn throughout the reign; they were made of silk, velvet, satin, and damask. The doublets were still more costly, and quilted and stuffed, 'slashed, jagged, pinched, and laced;' and over these were worn coats and jerkins in as many varieties as there are days in the year. The cloaks were of the Spanish, French, and Dutch cuts, of cloth, silk, velvet, and taffeta of all colors, trimmed with gold, silver, and silk-lace and glass bugles, inside and outside equally superb. The stockings, shoes, slippers, and ruffs resembled those of the ladies. *Hats* now began to supersede the bonnets of a former era. Those of beaver were exceedingly expensive, and they were for the most part made of felted wool, dyed. The most remarkable thing about these hats was their numerous shapes; some were steeple-crowned; others were flat and broad, like the battlements of a house; and others with round crowns, and bands of all colors, and ornamented with huge feathers and brooches, clasps, and jewels of great value. See **HAT**.

As regards female attire, the more conspicuous features in the reign of Elizabeth were the farthingale (q.v.) and ruff. The farthingale, or fardingale, consisted in an extravagant expansion of the lower garments, by means of cane or whalebone, by which the lady seemed to walk in a kind of inverted tub. The farthingale, referred to by Shakespeare, Butler, and other writers, mostly in a satiric vein, was the predecessor of the hoop, which in its turn, after an interval, was succeeded by the Crinoline (q.v.) and hoop-work of steel. The widely extended ruff of fine linen, like a huge frill, is seen in the pictures of Elizabeth and her envied rival, Mary Queen of Scots, both stars of fashion in their day.

Under James I., the male costume was somewhat more Spanish, as respects the slashing and ornamenting of the doublet and breeches. Late in the reign, however, the jackets or doublets were shortened, and the breeches reduced in size, and fastened in large bows at the knees; the well-stockinged leg was admired, and the hat worn low in the crown, and with broad brim, as seen in portraits of date 1619. Beards and whiskers had become almost universal in the reign of Elizabeth; but in that of James, the former was sometimes worn trimmed to a point, hanging down at the division of the ruff.

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In the female costume, there was little change. The farthingale continued to be worn by ladies of quality; a strong passion for foreign lace was introduced; pearls were the favorite jewels; and the ruff maintained its sway, so as to be anathematized from the pulpit: and the fancies of female costume were glanced at in a sermon preached before the king at Whitehall 1607—8, as ‘her French, her Spanish, and her foolish fashions.’

The fashion of dress in the reign of Charles I. became still more decidedly Spanish and picturesque. There were now worn collars of rich point-lace, large and hanging down on the shoulders, held by a cord and tassel at the neck, and now called *Vandyke*, from its being the most striking part of the dress in which Vandyke at that time painted portraits. The principal habits were vests and cloaks of velvet, or silk damask, short-trousered breeches terminating in stuffed roles, and fringes and points, and very rich boots, with large projecting lace tops. A dress of Charles

I. is thus described: A falling band, green doublet (from the armpits to the shoulders wide and loose), zigzag turned-up ruffles, long green breeches (like a Dutchman's), tied below the knee with yellow ribbons, red stockings, green shoe-roses, and a short red cloak lined with blue, with a star on the shoulder; the king sometimes wore a large cravat, and at other times a long falling band with tassels. The dress of the gay courtiers or cavaliers consisted of a doublet of velvet, silk, or satin, with large loose sleeves, slashed, and embroidered; Vandyke collar and band, and short embroidered cloak, worn on one shoulder; the long breeches, fringed and pointed, met the ruffled tops of the boots; the embroidered sword-belt was worn over the right shoulder, and in it was hung a Spanish rapier, and in the flapping beaver-hat was worn a plume of feathers confined by a jewel. A buff coat or jerkin was often worn, as a better defense than the doublet, which is sometimes covered. The engraving represents a citizen of this period more plainly attired.



Citizen in the time
of Charles I.

The female costume of this period was rather elegant than splendid. Gowns with close bodies and tight sleeves were worn, though the farthingale was retained, with a gorget ruff standing up about the neck like a fan. French hoods were still worn, though with little distinction as to rank. The hair was worn in small curls, and the hoods, of all colors, fastened under the chin with curious effect. Earrings, necklaces, and bracelets, were much worn; but the Puritan women were expected to forego lace, jewels, or even braided hair; and they retained the close hood and high-crowned hat. Toward the close of the reign



1, Flemish (1341); 2, French (1410); 3, German (1530); 4, Spanish (1580); 5, French (1590); 6, 7, Beginning of
 seventeenth century.

FASHION.

of Charles I., the cumbrous farthingale disappeared, with the yellow starched ruff and band. These tasteless fashions being dismissed, the female dress became very elegant, with its rich full skirt and sleeves, and falling collar edged with rich lace, and the hair worn in graceful ringlets; but these vanities were condemned by the Puritan party in an extreme reaction from the unbridled extravagance and luxury of the court.

With the restoration of Charles II. came certain tasteless innovations upon the elegant Vandyke costume of the time of Charles I., which were the first resemblance to the coats and waistcoats of the present day. Thus the most picturesque English attire lasted little more than a quarter of a century. Its decline was gradual; its chivalric character soon degenerated into grotesqueness, which in its turn changed to stark meanness. Early in the reign of Charles II., the doublet was much shortened, and worn open in front, where, and at the waistband, the rich shirt was shown; and the loose sleeves and breeches were decked with ribbons and points, and from the knee-bands hung long lace-ruffles. At the wrists, too, ruffles were worn; but the lace-collar was shorn of its points. The cloak was retained upon the left shoulder, and the high-crowned and plumed hat remained for a short time; but the crown of the hat was soon lowered. The petticoat breeches were another absurdity; although ornamented with ribbons at the sides, the lining strangely appeared below the breeches, and was tied at the knees; to match which, the sleeves of the doublet reached only to the elbows, and from under them bulged the ruffled sleeves of the shirt, both ornamented with ribbons. Meanwhile the skirt of the doublet had been lengthened from above the waist nearly to the knees, and had buttons and button-holes in its entire length, thus becoming a *coat*, and so named in an inventory of 1679; wherein also are the items of *waistcoat*, *breeches*, *pantaloon*s, *drawers*, and *trousers*, being the earliest mention of these articles. Stockings of various kinds were common; and 'the lower ends of stockings' are understood as socks. Instead of the lace-collar was worn the long square-ended cravat, of the same material, from Brussels, and Flanders.

Passing to the reigns of James II. and William III., we find the male attire gradually fashioned according to the artificial costume of the court of Louis XIV. Every article of dress was now more prim and exact. The petticoat breeches were exchanged for the close-fitting garments tied below the knee, and therefore called *knee-breeches*; the broad-brimmed hats were turned up on two sides, and edged with feathers or ribbons; the rich long lace cravat and embroidered waistcoat appeared; and the band was now narrowed, so as to resemble that worn at the present time by clergymen of some denominations. Wigs, which had been some time in use, were worn still longer than hitherto, hanging down in front, or flowing upon the shoulders, though the color was altered from black to suit the complexion. From the 17th to the end of the 18th c. was the era of *Hair-powder* (q.v.), *Wigs* (q.v.), and cocked.

FASHION.

hats: in these as in other matters there was excessive artificiality in the tastes of the higher classes. In the annexed cut, is a representation of a gentleman of 1750, with his flowing coat and ample cuffs, frills at the wrist, deep waistcoat hanging over the legs, long white hose drawn over the knees, his cocked-hat folded under his arm, and in his hand the open snuff-box (q.v.). Such was the appearance of what is traditionally known as the 'old English gentleman.' The coats of the 18th c. were of velvet, silk, or satin, as well as broad-cloth, and their colors very fanciful. Hogarth's favorite color was sky-blue; Reynolds's deep crimson and violet; and Goldsmith rejoiced in plum-color. About 1790, cloth became the general wear; the waistcoat being of the costlier materials, and embroidered, and sometimes the breeches. Buckles were worn at the knees and in the shoes till the close of the century; and the large square plaited buckle was the *ton* until 1791, when shoe-strings became general. Among the artificialities of dress during the greater part of the 18th c., none was more odious than that of hoops (q.v.), worn by ladies, who, by these means of expansion, were again made to appear as if standing in an inverted tub. In the reigns of George I. and II., a loose kind of drapery at the back of the dress, called a *sacque*, and hooded silk cloaks, were worn, also a very small muff, such as have been lately revived. In the 18 c., after the disuse of towering head-dresses veils (q.v.) of an elegant fabric were introduced, and the fan (q.v.) was an important article for ornament and flirtation.



Gentleman of 1750.

The formalities of the 18th c. received a severe blow at the French Revolution; and in the ten years, 1790–1800, a more complete change was effected in dress, by the spontaneous action of the people, than had taken place at any previous period in a century. The change began in France, partly to mark a contempt for old court usages, and partly in imitation of certain classes of persons in England, whose costume the French mistook for that of the nation generally. This new French dress was introduced by the party who were styled the *Sans Culottes*. It consisted of a round hat, a short coat, a light waistcoat, and pantaloons; a handkerchief was tied loosely round the neck, with the end; long and hanging down, and showing the shirt-collar above the hair, was cut short, without powder, *à la Titus*, and the shoes were tied with strings. The comparatively simple form of dress of the *Sans Culottes* found many admirers in England, and soon became common among young men; the change from antique fashions was greatly helped also by the imposition of a tax on the use of hair-powder, which was henceforth generally abandoned.

FASHION.

Pantaloons, which fitted closely to the leg, remained in very common use by those persons who had adopted them till 1814, when the wearing of trousers, already introduced into the army, became fashionable. It is proper, however, to mention that trousers had, for the previous 15 or 20 years, been used by boys, and were perhaps from them adopted by the army. Previous to the French Revolution, the dress of boys was almost the same as that of men. Although trousers—improperly called by some Americans *pants*—were generally worn after 1815, many elderly persons still held out in knee-breeches against all innovations, and to the present day an aged gentleman may occasionally be seen clinging to this 18th c. piece of dress. The general use of white neckcloths continued, notwithstanding the introduction of the standing collar, till the reign of George IV., when this monarch's taste for wearing a black silk kerchief or stock, and also the use of black stocks in the army, caused a remarkably quick abandonment of white neckcloths, and the adoption of black instead. The year 1825, or thereabouts, was the era of this signal improvement in costume.

While these leading changes were effecting, other alterations, less conspicuous, were from time to time taking place. The disbanding of the army after the peace of 1815 led to various transformations besides those above mentioned. While pantaloons were the fashionable dress, it became customary to wear Hessian boots; these, which had originated among the Hessian troops, were without 'tops;' and were worn with small silk tassels dangling from a cut in front; being drawn over the lower part of the pantaloons, they had a neat appearance; but the keeping of them clean formed a task that prevented their universal use: see *Boots*. When trousers were introduced from the practice of the army, the use of Wellington boots to go beneath them also became common. Referring to the era 1815-25 as that in which trousers, Wellington boots, and black neckcloths or stocks came into vogue, we may place the introduction of the surtout in the same period. From the time when the collarless and broad-skirted coat had disappeared about the commencement of the century, the fashion of coats had changed in various ways till the above-named era, when the loose frock-coat or surtout was added to the list of garments.

Such is a general account of the progress of fashions in England until nearly the present day. In these fashions, the Welsh, Irish, and Scotch, and in later times the Americans, have participated, and there is now little to distinguish the inhabitants of one of these countries from those of another. For what differences exist in particular localities—as, for instance, the round hats of the women in Wales, the checked gray *plaid* of the Lowland Scottish peasantry, and the *tartan* of the Highlanders—see the respective titles.

The general simplifying of dress subsequent to 1815, was not unaccompanied by an expiring effort to sustain a high style of fashion. The *macaroni*, or highly dressed beau of

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the 18th c., was now succeeded by the *dandy*, who, with mincing, affected manners, prided himself on his starched collars, his trouser-straps, and the flashy bunch of seals which dangled from his watch-chain. The Regency was the era of this kind of supreme dandyism, but it continued till later times, and characterized a number of leading public personages, of whom notices occur in Raikes's *Reminiscences*, 1831-51. In the present day may be noted a kind of break-down of everything like formality in gentlemen's walking costume. Plain cloths, of divers hues, called tweeds (q.v.), have almost superseded materials of a superior quality; cloth caps, or soft felted hats, called *wide-awakes* (see HAT), cover the head, and the feet are provided with short ankle boots instead of Wellingtons. In evening or dinner costume, however, the old etiquette of dress-coats and white neckcloths is maintained. Among the changes that are taking place in the morning dress, or at least that for walking and exercise, none is so remarkable as the growing fashion of wearing *knickerbockers*. These are wide loose trousers to below the knee, leaving the lower part of the leg only stockinged or covered with leggings. This fashion, copied immediately from the French *Zouaves* (q.v.), and partly perhaps from the common practice of stuffing the lower parts of the trousers roughly into boots in the western regions of the United States, is very much a resumption of the costumes seen in old Dutch prints. Should it become general, leg-gaiters or boots will come again into use, and the present generation may live to see the fashion of male attire work once more round to the knee-breeches of the 18th c. In female as well as in male costume, fashion seems to have a tendency to work in a circle; of this, the late but now obsolete, resumption of the farthingale, or hoop, under the name of crinoline, offers a sufficient example, besides affording a ludicrous instance of the unreasoning manner in which extravagances in dress are usually followed. It is to be observed, however, that Englishwomen, chargeable with whatever absurdities in dress, set a creditable example to their sex all over the world, in allowing no fantastic change of fashion to prevent them from taking out-door exercise in all weathers, which the introduction of india-rubber goloshes (q.v.) has materially aided.

As to the moral view that may be taken of the whimsicalities of female fashions, we might refer to the numerous papers of Steele in the *Tatler* and *Spectator*, and also to the writings of other 18th c. essayists, passing those over, it is enough to quote the words of Hazlitt, a more recent essayist. 'Fashion,' he says, 'constantly begins and ends in two things it abhors most—singularity and vulgarity. It is the perpetual setting up and then disowning a certain standard of taste, elegance, and refinement, which has no other formation or authority than that it is the prevailing distraction of the moment; which was yesterday ridiculous from its being new, and to-morrow will be odious from its being common. It is one of the most slight and insignificant of all things. It cannot be lasting, for it



Fashion.—8, Louis XIV. and his Queen (1670); 9, (1740); 10, Prussian court-dress (1780); 11, A la Grecque (1800); 12, (1804).

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depends on the constant change and shifting of its own harlequin disguises; it cannot be sterling, for, if it were, it could not depend on the breath of caprice; it must be superficial, to produce its immediate effect on the gaping crowd; and frivolous, to admit of its being assumed at pleasure by the number of those who affect to be in the fashion, to be distinguished from the rest of the world. It is not anything in itself, nor the sign of anything, but the folly and vanity of those who rely upon it as their greatest pride and ornament. It takes the firmest hold of weak, flimsy, and narrow minds, of those whose emptiness conceives of nothing excellent but what is thought so by others. That which is good for anything is the better for being widely diffused. But fashion is the abortive issue of vain ostentation and exclusive egotism: it is haughty, trifling, affected, servile, despotic, mean and ambitious, precise and fantastical, all in a breath—tied to no rule, and bound to conform to every rule of the minute.' For a large variety of amusing particulars concerning fashions, 'stars of fashion,' etc., during the past two centuries, see Mrs. Stone's *Chronicles of Fashion* (Lond. 2 vols. 1845).

FASKIDAR, n. *fās'kī-dār* [etym. doubtful]: in *ornith.*, the Northern Gull, *Larus parasiticus*, now *Lestris catarractes*.

FASQUELLE, *fās-kěl'*, JEAN LOUIS, F.B., LL.D.: 1808–1862; b. France: educator. He removed to the United States 1834, spent some years in teaching languages, was appointed prof. of modern languages and literature in the Univ. of Mich. 1846, and held the office till death. He published *A New Method of Learning the French Language* (1854); *Télémaque, with Notes and Grammatical References*; *Colloquial French Reader* (1854); *Napoleon, with Notes*; and *A General and Idiomatical Dictionary of the French and English Languages*. His French text-books had a large sale in the United States and in England.

FASSAITE, n. *fās'sā-īt*, or FAS'SITE [from *Fassathal*, in the Tyrol]: a mineral, a variety of augite.

FAST.

FAST, a. *fäst* [AS. *faest*; Icel. *fastr*; Swed. *fast*; Ger. *feste*, firm, unbroken, rapid in succession: mid. L. *fasté*, immediately: comp. Gael. *fas*, to increase]: close; immovable; firmly fixed; without leaving an interval, as, to follow *fast*; faithful, as a *fast* friend; rapid in motion; quick; speedy; extravagant; dissipated and gay, as a *fast* man; wild: AD. with quick steps; rapidly; firmly. **FAST'LY**, ad. -*li*, firmly; surely. **FAST'NESS**, n. -*nës* [Ger. *festung*, a place of security]: a stronghold; a place of unbroken defense. **FASTEN**, v. *fäs'n*, to fix firmly; to bolt or bar; to seize and hold on. **FASTEN'ING**, imp. *fäs'ning*: N. anything that binds or makes fast. **FASTENED**, pp. *fäs'nd*. **FASTENER**, n. *fäs'nër*, he or that which fastens. **FAST AND LOOSE**, changeable; inconstant (see below). **FAST BY**, close or near to. **IT RAINS FAST**, the drops fall close on each other.—**SYN.** of 'fasten': to fix; stick; link; cement; attach; annex; affix; secure.

FAST, v. *fäst* [Goth. *fastan*; Icel. *fasta*, to hold, to keep: Ger. *fassen*; Dut. *vatten*, to seize, to hold: comp. Gael. *fastadh*, to bind one's self, to engage: connected with preceding]: to abstain from food beyond the usual time: N. the abstaining from food for a certain time, or from particular kinds of food as flesh; a religious mortification or humiliation by abstaining from food; the time of abstaining from food. **FAST'ING**, imp.: N. act of abstaining from food. **FAST'ED**, pp. **FAST'ER**, N. one who abstains from food. **FAST-DAY**, a day set apart for special religious worship and humiliation.—*Fasting* is abstinence from food, either partial, when the restriction is confined to certain articles of food; or total when all sustenance is dispensed with for a specified time. The origin of the custom seems to be coeval with man's first experience of the salutary influence which abstinence exercises on the health, and with his more or less instinctive consciousness of the necessity of retaining the body in due subjection to the soul. By degrees, the self-mortification which it implied raised it into a sacrifice offered to the Deity; it became a religious observance, was surrounded with rites and ceremonies, and finally came to bear the stamp of a divine law. Climate, the habits of a people, and their creed, gave it at different periods different characteristics; but it may be pronounced a recognized institution with all the more civilized nations, especially those of Asia, through all historic times. It was in high estimation among the ancient Parsees of Irania. It formed a prominent feature in the ceremonies of the Mysteries of Mithras; and found its way, together with these, over Armenia, Cappadocia, Pontus, and Asia Minor, to Palestine, and northward to the wilds of Scythia. The ancient Chinese and Hindus, principally the latter, carried fasting to unnatural excess, in accordance with their primeval view—which they held in common with the Parsees—of heaven and hell, salvation and damnation, of the transmigration of the soul, and of the body as the temporary prison of a fallen spirit. Although the Vedas attach little importance to the excruciation of the body, yet the Pavaka, by the due observance of which the Hindu believer is purified

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from all his sins, requires among other things an uninterrupted fast for 12 days. Egypt seems to have had few or no compulsory general fasts; but it is established beyond doubt, that for the initiation into the mysteries of Isis and Osiris, temporary abstinence was rigorously enforced. In Siam, all solemn acts are preceded by a period of fasting, the seasons of the new and full moon especially being consecrated to this rite. In Java, where abstinence from the flesh of oxen is part of the religion of all, Buddhists and worshippers of Brahma alike, the manner and times of the observance vary according to the religion of the individual. Again in Thibet, the Dalai-lamaites and Bogdo-lamaites in common hold this law. That Greece observed and gave a high place to occasional fast-days such as the third day of the festival of the Eleusinian mysteries, and that, for instance, those who came to consult the oracle of Trophonius, had to abstain from food for 24 hours—is well known. The Romans did not omit so important an element of the festivals and ceremonies which they adopted from their neighbors, though with them the periods of fasting were of less frequent recurrence. See THESMOPHORIA.

As to the Semitic races, although we find the people of Nineveh undergoing occasional fasts, to which even animals were made to conform, yet the Mosaic law set apart for fasting one day only in the whole year. The 10th day of the seventh month (Tishri), called 'the Day of Atonement' (Yom Kippur), or, as the holiest of the whole year, 'the Sabbath of Sabbaths,' was ordained for 'the chastening of the *Nephesh*,' which the traditional law explains as meaning the strictest and most rigorous abstinence from all food or drink, as also from washing, anointing, the putting on of sandals, etc., from the sunset of the ninth to the rising of three stars on the evening of the tenth day. In process of time, five days of compulsory fasting were added, in commemoration of certain days of humiliation and national misfortune—viz., the 17th of the fourth month (Tamus), as the anniversary of the taking of Jerusalem both by Nebuchadnezzar and Titus; the 3d of the seventh month (Tishri), when Ishmael had killed Gedaliah, the Jewish governor appointed by the Babylonians (Jer. xli. 2); the 10th of the tenth month (Tebeth), in remembrance of the siege of Nebuchadnezzar; the 13th of the twelfth month (Adar), the fast of Esther, and the day most rigorously kept, next to the great Day of Atonement:—the 9th of the fifth month (Ab), anniversary of the destruction of the first temple by Nebuchadnezzar, and of the second by Titus. That the people had at all times been prone to attach great importance to the use of this penance as a visible sign of outward contrition, is clear from that ordinance of the Mosaic law which puts into the hands of the head of a family the power of confining self-imposed vows of abstinence within due limits. The community had a desire to express their penitence for sin, or their grief on the death of great men, by occasional fastings. Fastings were also considered efficient in averting the divine wrath, insuring victory over an enemy, or bringing down rain from heaven.

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Besides, fasting was frequently with those who wished to free their minds from all hindrances to meditation, as in the 40 days of Moses (Ex. xxxiv. 28), or the fast of Daniel (Dan. x. 2, 3). This fast of Contemplation, as it might be called, seems also to have been the model imitated by the Cabbalists, some of whom are known to have fasted from Sabbath to Sabbath. In later times, when, after the destruction of the temple, sacrifices had ceased, fasting, as causing a decrease in the flesh and fat of the individual, was considered in some degree a substitute for the animal which had formerly been offered up by the priest. From an aid to repentance and inward purification, which purpose alone it had been originally intended to serve, it became an end and a virtue in itself; an abuse, indeed, neither unknown nor undenounced even in the days of the prophets. If we add to this the endless chain of dire calamities and ever-renewed persecutions of which the Jews have been the victims for many a long century, the ever-increasing number of their fasts commemorative of deaths and tribulations will not be surprising. Most of these, however, which were superadded from time to time, soon fell into oblivion. Besides the six already mentioned, few entire days are now observed by the orthodox, and these merely of local observance. Fasting, with the Jews, always implies entire abstinence, and lasts, except on the Day of Atonement and the 9th of Ab--when the sunset of the previous evening is the sign for its commencement--from the break of the day to the appearance of the first three stars. Sackcloth and ashes, the garb of the penitent in ancient times, are no longer worn; but as the special holiness of the Day of Atonement is celebrated by various solemnities (see FESTIVALS), so the deepest mourning over the loss of temple and country is visibly expressed by many ceremonies in the Jewish synagogues and homes on the 9th of Ab. On that day also, to add individual to national sorrow, the cemeteries are generally visited. Of several half-days of fasting that have survived, are the first two Mondays and the first Thursday in the second month (Iyar) and in the eighth month (Cheshwan), (sheni vachamishi vesheni), in celebration of the two meeting-points of summer and winter; also, several days before the New-year or Day of Judgment, and before the Day of Atonement. The individual is bound to commemorate by fasting the anniversary of the death of his parents, his own wedding-day until the performance of the marriage-ceremony, and the birth of his first-born male child (till its 13th year--when the duty falls upon the child himself), on the day preceding the Pesach (Pasha)--in commemoration of the sparing of the Israelite first-born in Egypt. For the several hours' fasts on the two New-years' Days, and on the first six days of the Feast of Tabernacles, see FESTIVALS. The Sabbath causes the postponement of any fast--that of the Day of Atonement only excepted--which may happen to be coincident with it; and children--girls till their 12th, boys till their 13th year--pregnant women, and the sick, are exempted from the observance.

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In the time of Christ, fasting, as we have seen, was in high estimation. The Mondays and Thursdays—the market-days, on which the judges sat, and the law was read in the synagogues—were especially set aside for this purpose by the Pharisees. The Essenes fasted even more frequently. The Sadducees alone took exception to this rite, and were therefore considered ungodly. Christ himself neither approved nor disapproved of the custom, but, as in all matters of ceremony, allowed his disciples, Jews and Gentiles, to act according or contrary to their old habits. He allows and uses the privilege, but is distinctly against such a *commandment*, and even excuses those who do not fast. His own abstinence from food for 40 days was like that of Moses, entirely an individual act; and against a voluntary and limited imitation of such abstinence, to which the spirit might move a man, no objection whatever was to be taken. Rom. Catholics, however, maintain that all the words of our Lord, which to Protestants appear to discountenance the obligation of fasting, are directed exclusively against the ostentatious and self-reliant fasts of the Pharisees. They even understand the language which he used in condemning the practice of the Pharisee fasters, as containing a direct exhortation to his own disciples—not that they should abstain from fasting—that they should fast with suitable dispositions. They hold, moreover, that in exempting his disciples from fasting, he had regard only to the actual time of his own presence among them. It was incongruous, he said, that the children of the marriage should fast as long as the bridegroom was with them; but he added, ‘the days will come when the bridegroom shall be taken away from them; *and then they shall fast in those days*’ (Mk. iii. 20; Matt. ix. 15). Hence they infer, that from the time of our Lord’s ascension the practice of fasting became obligatory on his disciples, the temporary cause of the exemption hitherto existing having ceased. By Protestants it is held that during the first centuries of Christianity, voluntary fasts were frequent; the new converts adhering in most cases to their old rite, only taking care to change the days, which had been days of abstinence in their former religions, for others. Besides, fasts were considered a befitting preparation for holy acts and feasts, for ordination and Baptism. The time mostly observed annually in common by all were the 40 hours from Friday afternoon to Sunday morning, during which time Christ lay in the sepulchre. But not before the end of the 2d c. was anything like an ordinance promulgated with respect to fasting in the new religion. It was first Montanus who, as the pretended Paraclete, introduced, among other laws of excessive rigor, fasting, as an inhibition upon the faithful. The Wednesdays and Fridays, as the days when Christ was taken prisoner and crucified, were made days of strictest abstinence from all food; while on the other days of the week, dried, uncooked victuals only were allowed. Asceticism and monachism had their share in the gradual development of the doctrine of the necessity of mortifying the flesh, and as a natural consequence in the growth and

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diffusion of the custom of fasting. Yet, in the first six centuries, the difference in the various Christian communities was not greater in any other doctrine or ceremony than in this. Bishops and councils, however, gradually fixed the times and seasons for the whole of Christendom. The 40 hours had gradually become 40 days, called the *Quadragesima*; and the Council of Orleans, 541, made it binding upon every Christian not to eat any meat during this time, save only on the Sundays. However, here again Rom. Catholics dissent strongly from the Prot. view of this history. They admit that the followers of Montanus did introduce greater rigor and frequency into their fasts; but they deny that before the time of Montanus the practice of fasting was not fully recognized in the Christian Church, and regarded as strictly obligatory; since, as they allege, the very earliest allusions to the 40 days' fast of Lent (*tessaracosté*) regard it as an established and recognized institution. Their claim is that the very first fathers who allude to it, speak of it as 'handed down and observed by the church;' and that so far is its origin from being ascribable to the influence of Montanism, that, on the contrary, the earliest relaxations which the church admitted were a reaction against the excessive and intolerable rigor of that fanatical sect. Returning to the general flow of church-history, we note that the eighth council at Toledo, 7th c., declared those who ate meat during Lent, sinners unworthy to partake in the resurrection. From the 8th c. to the 11th, when a gradual reaction set in, the laws of fasting and the punishments awarded to the transgressors became stricter and stricter; interdict and excommunication were among the penalties. By degrees fasts had become so numerous and different in kind, that they were divided into—1. *Jejunium generale* (a fast binding for all); 2. *Consuetudinarium* (local fast, etc.); 3. *Penitentiale* (atonement for all transgressions); 4. *Votivum* (consequent upon a vow); 5. *Voluntare* (for the better carrying out of an undertaking). These, again, were kept as 1. *Jejunium naturale* (entire abstinence from food or drink, especially in preparation for reception of the Eucharist); 2. *Abstinentia* (certain food only being allowed, but several times a day); 3. *Jejunium cum abstinentia* (the same food, but taken only once a day); and 4. *Jejunium sine abstinentia* (all kinds of food, but only once a day). The food prohibited on partial fast-days included, during certain periods, not only the flesh of quadrupeds, fowl, and fish, but also the '*lacticinia*'—i.e., all that comes from quadruped and bird, as butter, eggs, milk, etc. The discrepancies and differences of opinion with respect to the times and modes of fasting, or to the food prohibited, even among successive popes and contemporary bishops and elders of the church, were so numerous, and involved in such obscurities, that the church historians themselves shrink from enumerating them. Suffice it to say, that they gradually developed in the Rom. Church into—1. Weekly fasts, of which Friday, as the day of the crucifixion, seems to have been early and generally observed. To this was added the Wednesday, as

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the day on which the death of Christ was resolved upon. These two days received the name of Stations; a term borrowed from the *stationes* of the Roman soldiers, in accordance with the views held by the ascetics and monks that they were the warriors of Christ. At a synod in Spain in the beginning of the 4th c., the Saturday was superadded, but this innovation met with great opposition, especially in the East, where Jewish notions regarding the Sabbath had obtained a more permanent recognition. 2. Vigils, originally night-services observed by the first Christians on the eve of Sundays and festivals, partly in imitation of the Jewish custom of celebrating the entrance of the sabbath and of festivals on the evening of the previous day, and partly in fear of the danger to which a service in the daytime would have exposed the early converts. Although these night-services became unnecessary in the course of time, they were still continued till the 4th c., when owing to the abuses to which they led, they were abolished, or rather transformed into fast-days kept on the eve of great festivals in honor of Christ, Mary, Saints, and Apostles. 3. The great or 40 days' fast (Quadragesimal fast), most important and most rigorously enforced of all. The 40 hours of fast, in commemoration of the 40 hours during which Christ's body lay in the tomb, gradually expanded to 36, or rather 40 days, in pious allusion to the 40 days of Moses, Elijah, Christ, the 40 years' sojourn in the desert, or the 40 camps—all considered typical; and the fasting became severer the nearer the crucifixion week itself approached, in which many other signs of mourning and contrition were generally exhibited. 4. The Quatember fasts on the Wednesdays, Fridays, and Saturdays in one week of each season, in imitation of the four Jewish fasts in the 4th, 5th, 7th, and 10th months.—There were many other fasts, such as those of ordination, etc., but of only temporary existence. Without detailing the various dispensations granted by the church or the special pastoral letters generally issued before Quadragesima, or the variations in the observance of fasts and fasting in our own days, we note only, that fasts have in a great measure lost their former severity, and that only partial abstinence is the rule in all cases. The opinion held by the Rom. Cath. Church, and some other Christians, in former days, that fasting is meritorious, and conducive to the salvation of the soul, has undergone no change.

In the Greek Church, fasting was and is kept with much greater severity, the non-observance of it being the least venial of sins. The fast-days extend over almost three-quarters of the year. The principal ones are the Wednesday and Friday—with a few exceptions—throughout the year; the great Easter fast, lasting 48 days; that of Christmas, 39 days; that in honor of the Virgin, 14 days; and that of the Apostles, beginning on Monday after Trinity, and extending to June 29. Besides those smaller fasts of preparation, which correspond to the vigils of the Roman Church, they have many more occasional fasts.

The Church of England considers fasting a praiseworthy,

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but not obligatory custom. According to Hook's *Church Dictionary*, the distinction between the Prot. and the Rom. Cath. view of fasting consists in this, that the Rom. Cath. regards the use of fasting as an imperative means of grace, the Prot. as only a useful exercise preparatory for the means of grace. In proof how much the Church of England has left the question of fasting to the conscience and discretion of her members, it may be observed that she has neither defined the mode or degree of fasting, nor anywhere given a positive command to fast. It has been remarked that no bishop of the Church of England has in an episcopal charge laid down fasting as a positive requirement. The days named by the English Church as seasons of fasting or abstinence, are the 40 days of Lent (q.v.), including Ash Wednesday and Good Friday; the Ember (q.v.) days; the three Rogation (q.v.) days; and all the Fridays in the year (except Christmas Day); and the eves or vigils of certain festivals.

The Scottish almanacs contain lists of the *fast-days* of all the principal places in Scotland. These are generally one in each year, appointed by the kirk-session of the Established Church (Presb.) of the parish, or by concurrence of kirk-sessions in towns, but generally by use and wont fixed as to their date. The fast-day is always some day of the week preceding the *Communion Sunday*, or Sunday set apart in Presb. churches for the dispensation of the Lord's Supper. It is usually appointed as a day for 'fasting, humiliation, and prayer.' Business is generally suspended, shops shut as on a Sunday, and churches opened for public worship. By an act of parliament not many years since, factories are prohibited from carrying on work on the parish fast-day, but in consequence of the ecclesiastical divisions in Scotland, it has become more common than it was for agricultural and other kinds of work to be carried on. The fast-day of a large town is always a busy day on the railways, many taking advantage of it for excursions, and making in a day of amusement; too many, also, a day of dissipation and revelry. That it is right to keep up the fast-day in these circumstances is doubted by many who themselves conform to its religious observance, though of that observance *fasting* does not now generally form a part. Many, however, doubt if it ever was a good institution; alleging that it is inconsistent with the frequent celebration of the Lord's Supper, which they deem right and desirable, and to which there is a growing tendency. The Scottish Reformers, as appears from the *First Book of Discipline*, contemplated the ordinary celebration of the Lord's Supper at least once a month; and the fast-day, as it now exists in Scotland, derives its origin from a later period.

In the United States, the churches observe fasts according to their various rules, or by special appointment. Some of the older states, especially in New England, have from the beginning had the custom of an annual fast-day designated by the governor, whose observance of late years tends to be remote from religious. The president has on rare occasions of special national crisis appointed fast-days,

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which have had general observance. It is recognized, however, that all such appointments by the civil power have no force beyond that of pious recommendation and invitation.

A few words remain to be said of the Mohammedan fasts. Islam, as a development from Judaism and Christianity, adopted this custom with many others from both churches. During the whole month of Ramadan, in which the Prophet is fabled to have brought the Koran from heaven, eating, drinking, smoking, smelling perfumes, etc., are strictly forbidden from daybreak till sunset; for the intervening nights, however, all these restrictions are removed. There are, besides, many voluntary fasts, expiatory like the 10th of Moharram, corresponding to the Jewish Day of Atonement, or for the averting of the divine wrath in sudden calamities, or as an indemnification for the omission of certain pious acts, as the pilgrimage, etc. See JEWS: MOHAMMEDANISM: MONKS.

Besides the *Bible*, *Schulchan Aruch*, *Koran*, and the Fathers generally, see the following authorities on this subject: Bingham, *Orig.* IX., 1, 21; Fabricius, *Bibliogr. Antiquaria*, c. 11; J. A. Muratori, *De Quatuor Temporum Jejuniis*, etc.; J. Dallœus, *De Jejuniis et Quadragesima*, 1654; Schöne's *Geschichtsforschungen*, Th. 1; *Briefe über d. Gottesd. d. morgenl. Kirche*, von Dr. E. v. Muralt (Leip. 1838); Siegel, *Altchristl. Alterthümer*; Dassel, *De Jure Temp. Quadrages.*, 1617; Walch, *De Jejuniis Quadragesimali* (Jenæ 1727); Homborg, *De Quadragesima Veterum Christianorum et ritibus in ea quondam usitatis diss. qua etiam de recentior. Papist., Græc., Russ., Syrian., Georgian., Maronit., Jacobit., etc., disseritur* (Helmst. 1677).

Fasting, or deprivation of food, is, in a physiological sense, inconsistent with the continuance of life in most warm-blooded animals more than a few weeks. If water is not supplied, the period is much shorter, being in man commonly not more than a very few days, or at most a week. Persons have been found in coal-pits and mines, and in other situations where access to food has been impossible, but where water could be had, as long as six weeks after their seclusion, still alive, though very feeble; and a very small daily allowance of food has supported life longer than this, as in some cases of shipwreck, and other accidents at sea. Cases of alleged fasting, longer than this, as in the notorious woman of Tuthury, England, are certainly in most instances impostures. The insane appear sometimes to bear fasting better than the healthy. Hibernating animals (see HIBERNATION) are capable of sustaining the want of food for an apparently indefinite period of weeks during the winter sleep; but no warm-blooded animal can endure fasting in anything like the same degree as the reptiles, in many of which, indeed, the natural state of existence is one of long intervals between the times of taking food, and in which the vital change of texture is remarkably slow. Thus, the remarkable amphibious animal, the *Proteus anguinus*, has been known to live for years without food, and the same is true of salamanders,

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tortoises, and even goldfishes. In fasting, the body gradually emaciates, most of the secretions are arrested, or greatly diminished, and at last the animal heat falls rapidly in all parts of the body. In attempting the recovery of persons reduced by fasting, food must be given in very small quantities at a time, and of the most nourishing and digestible quality; stimulants should be either withheld; or very cautiously administered. The most important point, next to the regulation of the food, and sometimes even before food is given at all, is the removal of the torpor and chill of the body by gradually applied heat, with friction of the limbs. See Tiedemann's *Physiology*; Burdach's *Physiology*; Chossat, *Recherches sur l'Inanition*.

FAST AND LOOSE: a cheating game, called also *Pricking at the Belt*, or *Prick the Garter*, which appears to have been much practiced by the gypsies in the time of Shakspeare. The following is a description: 'A leathern belt is made up into a number of intricate folds, and placed edgewise upon a board or table. One of the folds is made to resemble the middle of a girdle, so that whoever shall thrust a skewer into it would think he held it fast to the board; whereas, when he has so done, the person with whom he plays may take hold of both ends, and draw it away.'

FASTEN, FASTNESS: see under **FAST 1.**

FAS'TEN'S EVE: see **SHROVETIDE.**

FASTI, *fäs'ti* [L., pl. of *fastus*, according to divine law; from *fas*, divine law]: applied to things that are according to divine law. Hence the *dies fasti*, or lawful days, among the Romans, were the days on which it was lawful to transact business before the prætor. But the sacred books in which the lawful days of the year were marked, were themselves denominated *fasti*, and the term was employed, in an extended sense, to signify various kinds of registers, which have been often confounded with each other. These registers fall into two principal divisions—the *Fasti Sacri* or *Kalendares*, and the *Fasti Annales* or *Historici*.

1. *Fasti Kalendares*, or calendars of the year, were kept exclusively by the priests for about four centuries and a half after the building of the city. The appearance of the new moon was proclaimed by a pontifex, who at the same time announced to the people the time which would intervene between the Kalends and Nones: see **CALENDS: CALENDAR**. On the Nones, the country-people assembled for the purpose of learning from the Rex Sacrorum the various festivals of the month, and the days on which they would fall. In the same way, those who intended to go to law, learned on what days it would be right (*fas*) to do so. The mystery with which this lore was surrounded, for purposes of power and profit, by the favored class, was dispelled by Cn. Flavius, the scribe of Appius Cæcus, who surreptitiously copied from the pontifical book the requisite information, and published it to the people in the forum. From this, time-tables (*fasti*) became common, much resembling modern almanacs. They contained the days and months

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of the year, the Nones, Ides, lawful and unlawful days, etc.; astronomical observations on the rising and setting of the fixed stars, the commencement of the seasons, brief notices concerning the introduction and signification of certain rites, the dedication of temples, the dates of victories, disasters, and the like. In later times, the exploits and honors of the imperial family were duly entered in the calendar. The celebrated *Fasti* of Ovid is a sort of poetical companion to the calendar, as published by Julius Cæsar, who remodelled the Roman year.

Several very curious specimens of *fasti* on stone and marble have been discovered, of which one of the most remarkable is the *Kalendarium Prænestinum*, which stood in the lower part of the forum of Præneste, described by Suetonius. Of these ancient *fasti*, 11 are enumerated by Foggini, learned Italian antiquary. One of the most interesting is a rural almanac, known as the *Kalendarium Rusticum Farnesianum*, cut on four sides of a cube, each side of which is divided into three columns, each column embracing a month. The various agricultural operations to be performed in each month are given on this curious relic, in addition to the ordinary information contained in these calendars. In the month of May, for example, the rustic is told that his corn must be weeded, his sheep shorn, his wool washed, etc.

2. *Fasti Annales* or *Historici*, were chronicles, containing the names of the consuls and other magistrates of the year, and an enumeration of the most remarkable events in the history of Rome, noted opposite the days on which they occurred. From its application to these chronicles, the word *fasti* came to be used by the poets as synonymous with historical records. A very interesting specimen of *fasti* of this class was discovered in the forum at Rome 1547. The fragments into which it had been broken were collected and arranged by Cardinal Alexander Farnese, and placed in the Capitol, where they may still be seen.

FASTIDIOUS, a. *fäs-tid'ĩ-üs* [L. *fastidĩosũs*, disdainful, fastidious—from *fastidĩũm*, aversion: It. *fastidioso*: F. *fastidieux*]: difficult to please; over-nice. **FASTID'IOUSLY**, ad. -ly. **FASTID'IOUSNESS**, n. squeamishness of mind or taste.—**SYN.** of 'fastidious': squeamish; over-critical; punctilious; particular; difficult; disdainful; over-delicate.

FASTIGIATE, a. *fäs-tij'ĩ-āt*, or **FASTIG'iated**, a. -ā-tēd [L. *fastigĩũm*, that which is made pointed, the highest point: It. *fastigio*]: in *bot.*, having a pyramidal or sheaf-like form, from the branches being erect and close to the stem, as in the poplar-tree.

FASTIGIUM, n. *fäs-tij'ĩ-ũm* [L.]: pediment of a portico, so called because it follows the form of the roof; the comb or ridge of a roof.

FASTNET LIGHT: light-house, on a rock off the Irish coast, 3½ m. s.w. of Cape Clear (q.v.); with a revolving light 148 ft. above high water, visible 18 miles.

FAT, a. *fät* [Ger. *fett*; Icel. *feitr*; Dut. *vet*, fat]: stout; opposite of *lean*; plump; rich; fertile: N. a solid oily sub-

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stance of a white or yellow color, found in animals; the best part; in *Script.*, for VAT: V. to grow fat or full-fleshed; to make fat. FAT'LY, ad. -*ly*. FATS, oily substances solid at ordinary temperatures, and not differing essentially from the liquid oils (see OILS). ANIMAL FATS: see FATS, ANIMAL. FAT'NESS, n. quality of being fat or plump. FAT'TISH, a. -*tish*, somewhat fat. FAT'TY, a. -*ty*, containing fat; having the qualities of fat; caused by fat; greasy. FAT'TINESS, n. -*ness*. FAT'LING, n. a lamb or kid, or suchlike, fattened for slaughter. FAT'TED, a. made fat. FATTEN, v. *fāt'n*, to make fat; to make stout or plump; to enrich; to grow plump or fleshy. FATTENING, imp. *fāt'ning*: N. the process of making fat; the state of becoming fat. FATTENED, pp. *fāt'nd*: ADJ. made fat or plump. FATTENER, n. *fāt'nēr*. FAT-HEN, n. in *bot.*, name applied to various plants, especially to certain *Chenopodiaceæ*, having thick, succulent foliage. FAT-VESICLES, n. in *phys.*, the vesicles in the bodies of men and the inferior animals in which fat is deposited, often in the interstices between organs. FATTY ACIDS, a series of organic acids, some of which are combined with glycerine to form fat (see OILS). FAT LUTE, composition of linseed oil and pipe-clay (see LUTE). FATTY-INFILTRATION, n. in *anat.*, an infiltration of the tissues with fat deposited in them from the blood. It is only a deposit, and is therefore not synonymous with fatty degeneration, which is the abnormal deposition of free fatty matter in the elements of animal bodies. FATTY-KIDNEY, n. in *med.*, name for Bright's disease of the kidney.

FAT, n. *fāt*: OE. for VAT.

FATA MORGANA, *fā'tā mōr-gā'nā* [It. the fairy *Morganā*—from It. *fata*, a fairy; Bret. *mor*, sea; *gana*, fine lady]: striking kind of mirage at sea, observed especially in the Strait of Messina. A spectator on the shore sees images of men, houses, ships, etc., sometimes in the water, sometimes in the air, the same object having frequently two images, one inverted: see MIRAGE.

FATAL, a. *fā'tāl* [F. *fatal*—from L. *fatālis*, of or pertaining to fate, decreed—from *fātūm*, a prediction, fate: It. *fatale*]: deadly; mortal; causing death or destruction; inevitable; necessary; calamitous. FA'TALLY, ad. -*ly*, in a fatal manner; mortally. FATALITY, n. *fā-tāl'i-ty* [F. *fatalité*]: tendency to danger or disaster; inevitable necessity; mortality. FATALISM, n. *fā'tāl-izm*, the doctrine of an inevitable necessity overruling all things. FA'TALIST, n. one who maintains that all things happen by inevitable necessity. FA'TALIS'TIC, a. -*tik*, implying fatalism: see FATE.

FATE, n. *fāt* [OF. *fat*, fate—from L. *fātūm*, what is spoken, destiny: It. *fato* (see FATAL)]: inevitable necessity; event predetermined; lot; destiny; death; destruction. FATED, a. *fāt'ēd*, doomed; invested with any power or quality by fate; decreed by fate. FATES, n. plu. *fāts*, in *anc. myth.*, the three goddesses or destinies supposed to preside over the life and death of every individual—named respectively Clotho, Lachesis, and Atropos (see PARCÆ).—SYN. of 'fate': doom; fortune; chance.

FATE—FATALISM.

FATE—FA'TALISM: denoting a vague conception which has had more or less place in all religions. The words are derived from the Latin *Fatum*, which has primarily a passive signification, denoting something uttered—a supreme decree or ordinance. The Greeks expressed the same thought by *Eimarmenē*. *Moira*, was the name given to the active personification of the idea—the goddess Fate or Destiny. It represented, in Greek mythology, the final monotheistic element—the vague Unity binding together and dominating over the crowd of Olympian deities. In Homer, *Moira* has a double meaning, appearing sometimes as superior to the will of Zeus, and sometimes as inferior to this will. With the course of Grecian thought, the conception of Fate became more spiritualized. In *Æschylus* it is an inexorable Destiny; in *Sophocles* and *Plato*, it is more of a free and ordering Will. In the latter forms of Greco-Roman speculation, it undergoes various modifications. With the Epicureans, it seems identical with Chance (*Tuchē*); with the Stoics, it is the very opposite of this. In the one case, the Absolute is a mere blind fatality; in the other case, it is an imminent necessity of reason, governing with iron sway the apparently accidental phenomena of life.

In modern times, in Christianity and Mohammedanism the same general conception is found in various forms. In Mohammedanism, the Highest is conceived as an arbitrary and inexorable law, swallowing at every lower law of activity, and permitting no scope to freedom of development in human nature. In Christianity and the modern speculation which it has colored, the conception shows itself less broadly in the well-known doctrines of Predestination and of Philosophical Necessity. In the Predestination theory of Augustine, Calvin, and many others, the old fatalistic doctrine is repudiated; the recognition of a free self determining element in the divine Will, separates their idea of it altogether from that of a mere blind Destiny; but the influence of the mode of thought out of which the old idea sprang, appears in the manner in which the divine decrees are sometimes spoken of as inexorably overbearing human freedom. In the doctrine of philosophical necessity promulgated by Leibnitz and some other thinkers, and in a somewhat different form by Modern Positivism, the same idea emerges under the name of inevitable sequence—of an invariable connection linking together all phenomena material and mental. An immutable law is declared to pervade and harmonize all existence. This is a far higher conception, but it is not difficult to see how easily in minds of a certain order it might lapse into the old pagan doctrine of Fate.

The doctrines of Predestination and of Philosophical Necessity have been supposed mutually to support each other; in reality, they are very different doctrines. The first starts from the dominating conception of the divine Will as over-ruling all things, and approaches fatalism by ascribing in certain cases such an absorbing energy to this will as to leave no power of free action to any other Will.

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It conceives, or at least admits the conception of, everything as swallowed up in the single omnipotence of the Divine. It is in tendency *Pantheistic*. The other starts from the dominating conception of law in nature, and approaches fatalism by investing this law with an immutable and self subsistent character. It looks at all existence as a mere undeviating routine of development, and tends in exact opposition to the other doctrine, to shut out the Divine behind the screen of the Natural. It is in tendency *Atheistic*. It is merely the *tendency* of the respective speculations that is thus characterized.

The conception of Fate in some higher or lower, worthy or unworthy form, springs irresistibly from man's consciousness of the transcending greatness of what is outside and above his own feeble existence—of the objective Power that incloses and molds his own subjective activity. As such, the conception will never wholly disappear from human speculation, however endlessly modified it may be.

FATEHGANJ : see FUTCHGUNGE.

FATEHGARH : see FUTTYGURH.

FATEHPUR : see FUTTEHPUR.

FATHER—FATHER-LASHER.

FATHER, n. *fà-thër* [AS. *faeder*; Icel. *fathir*; Goth. *faðar*; Gr. and L. *pater*; Ger. *vater*, father]: a male parent; the first ancestor (see PARENT AND CHILD: FAMILY: PATRIA POTESTAS); a common title, applied to a protector, deliverer, or supporter; God the Creator; a familiar term for an old man; any man reverend for age, learning, or piety; a name given to Rom. Cath. priests; the first originator. **V.** to ascribe or charge to one as his offspring or production; to adopt anything as one's own. **FA'THERING**, imp. adopting as one's own; ascribing to any one as the father. **FA'THERED**, pp. *-thèrd*. **FATHERLAND**, n. one's native land. **FATHER-IN-LAW**, n. the father of one's husband or wife. **FA'THERLESS**, a. without a father. **FA'THERHOOD**, n. the character or authority of a father. **FA'THERLY**, a. *-lì*, paternal; like a father: **AD.** in the manner of a father. **FA'THERLINESS**, n. parental kindness and care. **FATHER-LONGLEGS**, n. common name for the crane-fly; called also daddy-longlegs. **THE FATHER**, the first person of the Holy Trinity (see TRINITY, DOCTRINE OF THE). **THE FATHERS**, the early Christian writers till the seventh—some say thirteenth—c. **TO FATHER IT ON ME**, to impute it to me.

FATHER-LASHER, *fà'thër-lăsh'ër* (*Cottus bubalis*): very common fish on the British coasts, the most spiny of the British species of *Cottus* (q. v.), and armed with strong spines particularly on the back of the head—which is large—and on the gill-covers. When touched, it distends its gill-covers, sets out its spines, and assumes a very threatening ap-



Father-Lasher (*Cottus bubalis*).

pearance. Its general aspect is indeed forbidding, and boys who angle from the rocks and pier-heads are usually averse to touch it, though it is said to be wholesome and agreeable food. It is of a brown color above, whitish beneath, curiously marbled and spotted, the fins marbled black and white. American species are known as sculpins, sea-robins, sea-toads, etc.

FATHERS OF THE CHURCH.

FATHERS OF THE CHURCH (*Patres Ecclesiastici*): certain early writers of the Christian Church. The term *Abba*, Grecized $\alpha\beta\beta\alpha\varsigma$ (Father), in use among the Talmudists as a synonym of Rabbi (my master), and constituting, according to Maimonides, the third or lowest honorary title of a Doctor of the Divine Law, was in the first centuries of Christianity applied indiscriminately to all theological writers distinguished by learning, genius, or piety. Gradually, however, the word Father, or, more fully, Father of the Church, was confined to those teachers whose writings were considered pre-eminently orthodox, and who might be looked upon as the *progenitors*, as it were, of certain dogmas, upon the development of which they had exercised a more or less direct influence; while those writers who diverged into the fields of heretical opinion were called simply *Scriptores Ecclesiastici* (Church-writers). Out of the number of the former, some few master-minds, to whom the church owed a still greater tribute, were again singled out as *Doctores Ecclesie* (Doctors of the Church), which title of pre-eminence, however, is bestowed on many writers who lived subsequently to the time of the Fathers, in consideration of their 'purer and more excellent doctrine' (Benedict, xiv., *Bulla, Milit. Eccles.*).

The temporal limits within which the Fathers are to be confined, as well as their proper share of authority in matters of faith, have long been points of grave discussion. While some include the Fathers of the 1st. c., generally called the Apostolical Fathers, on account of their being the contemporaries or disciples of Christ and the apostles, they are excluded by others; again, by some, the 7th c. is made the closing period, while others carry the list down to the 12th, or even the 13th century.

With respect to the authority of the Fathers, some, like Fredegis, held their words as sacred as those of the prophets and New Testament writers; while others, like Alphonsodi Castro, Melelius Cano, and Cardinal Cajetan, ridiculed the notion that Symmachus should be made equal to St. Paul, or Didymus to St. John the Evangelist. Others like Pope Gregory and the majority of writers, took the middle course of regarding them not as infallible, much less as prophets and apostles, but held, that when in matters of faith the most perfect and unswerving unanimity reigns among them, then only, the Holy Ghost is to be considered to speak through them. See **RULE OF FAITH: INFALLIBILITY.**

Immense as is the range and variety of their writings, ascetic, apologetic, polemical, exegetical, moral, historical, or dogmatical, so also is the diversity of their individual value. Nothing can be further from historical justice than either the wholesale laudation or condemnation of these writers as a body; but whatever stand we may take, we cannot but see that their writings are of great moment either as instruction or as history. Stretching over the entire extent of that period which forms the turning-point between the antique and modern world, they faithfully and often unconsciously portray that awful change, of which they were

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in no small degree the instruments—the gradual wane of old faiths, and of an old civilization, and the slow and struggling rise of that which was to replace them; while they preserve the most minute and trifling details with the same accuracy as the most momentous event, as each happened to bear upon their subject. The philosopher, the historian, the antiquary, each and all will find their writings, as a whole, an inexhaustible fund. Of no less interest, perhaps, are their works in relation to the writers individually. These, issuing from all parts of the then known world, from all ranks, all creeds, could not but impress the stamp of their nationality and callings, besides that of their youth or age, vigor or feebleness, upon their writing—Jew, Greek, Roman, African, Spaniard—orator, poet, lawyer, statesman, priest, they all bring with them that which was their own before they embraced the new faith: their dialectic power, their fantastic poetry, their graceful speech, their stern austerity. What Greek subtlety did theoretically for the development of dogma in Origen and Athanasius, that also Roman thoroughness did practically for the erection of the hierarchy in Leo the Great and Gregory III.; and while from Egypt came asceticism and monachism, the ascendancy of spiritualism over sensualism is owing to those who came from the n. coast of Africa. To some extent, Platonism, especially neo-Platonism, Aristotle, and Greek philosophy generally, are found developed in these works, and infused into the new faith by the former teachers of the academies themselves, who mostly retained their old philosophical garb.

The following is a brief survey of these writers: for the more eminent among them, see the respective titles. According to the now generally adopted method of dating them from the 1st to the 7th c., they are divided into two distinct periods, the first of which extends to the Council of Nicæa, 325. Of those who head the list, the Apostolic Fathers—so called from their supposed connection with Christ and the apostles—very little need be said, as their writings, mostly of an ascetic character, have come down to us in a corrupt and mutilated state, and as the writers themselves owe their chief celebrity to the times in which they lived. We have here Barnabas, the son of Teostes, and the companion of the apostle Paul (Acts ix. 27; xii. 25); Clement, supposed to have been third Bp. of Rome; and the Clement mentioned by Paul (Phil. iv. 3); Hermas, identical perhaps with the Hermas of Paul's Epistle to the Romans (xvi. 14); Ignatius, Bp. of Antioch; Polycarp, Bp. of Smyrna; Papias; Dionysius the Areopagite, etc. Next follow the Apologists, or those Fathers whose chief aim was the defense of the new faith against the Roman state, and non-Christian authors; and who were the first to make their scientific culture, and especially the Platonic philosophy, subservient to Christianity, for this purpose: Quadratus the 'Evangelist,' travelling missionary; Aristides, philosopher; Justin Martyr, well-known author of the two Apologies and the Dialogue with Trypho (or rather Trypho); Tatian of Assyria, who, having examined the differ-

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ent forms of worship, as well as the systems of philosophy prevalent in his time, felt satisfied with none but Christianity, and became a disciple of Justin, and a vindicator of the philosophy of the 'barbarians;' Athenagoras, who addressed his Apology to the Emperor Marcus Aurelius and his son Commodus, and wrote a Defense of the Doctrine of the Resurrection; Theophilus, Bp. of Antioch; Miltiades, etc. Next come the Church Fathers of Asia Minor, men of more practical and peaceful tendencies: Hegesippus, perhaps an Ebionite; Irenæus, Bp. of Lyon and Vienne, who wrote a refutation of the Gnostic system; Hippolytus, his disciple, of unknown birthplace and renowned name. In the N. African Church, the development of which is of the utmost moment inasmuch as its language, dogmas, and laws were adopted by the greater part of the Christian world in the West, we find Tertullian of Carthage, rhetorician and advocate, a man of profound mind and vast influence; Cyprian, author of the *Testimonies* in favor of Christ; Commodian, writer of the *Rules of Living*; and Arnobius, rhetorician of Sicca, in Numidia. The first comparatively barren, though otherwise highly important church, is the Roman. The pre-eminently practical Roman mind looked more to the outward growth and well-being of the church than to literary excellence, and thus we have only two distinguished authors to be noticed here—the Presbyter Caius, known as an opponent of the Montanists; and the Presbyter Novatian, who wrote a treatise on the Jewish laws respecting food. The church which, more than any other, endeavored to combine speculation with faith, and which gradually became, through its high degree of culture and erudition, the very centre of Christianity, is the Alexandrian. And here we have Pantænus; Clement the Alexandrine, known chiefly by his *Stromata* or *Elements of the Gnosis*; Origen, called Adamantinus, eminent Neo-Platonist, born 185 in Alexandria, one of the most influential writers of the whole Christian Church; Hercules, with his disciple Dionysius, a liberal and moderate man; Gregory, worker of miracles; Pamphilus, and Julius Africanus, first Christian chorographer.

In the second period, which dates from the Nicæan Council, and comes down to Gregory II., 604., period altogether superior, on account of the great number of intellectual and erudite men who devoted their lives and labors to the church, we have to distinguish the Greek from the Latin Fathers. Among the Greek, we have again to draw a line between those of the Alexandrine school on one hand—like Eusebius Pamphili, the Herodotus of the church; Athanasius, father of orthodoxy; Basil the Great, Doctor Ecclesiæ, and his brother Gregory of Nyssa; Gregory of Nazianzen, called the Theologian, by war of eminence; Didymus; and Cyrillus, some time Patriarch of Alexandria, chief prosecutor of Nestorius—and on the other hand those of the Antiochian school, where we find Ephraem Syrus, 'the prophet of the Syrians;' Cyril of Jerusalem, the converted Arian; John Chrysostom, of brilliant eloquence; Diodorus, B. of Tarsus, one of the chief founders of the

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Antiochian school; and Theodoretus, Bp. of Cyrus. Besides these, we find, of Greek Fathers who belonged to neither school—Epiphanius, violent adversary of Origen; Socrates Scholasticus, continuator of Eusebius's *Ecclesiastical History*; Philostorgius, Arian Church historian; Logomenus; Evagrius; Macarius the Elder, known chiefly through his miracles and combats with the devil; Procopius of Gaza, rhetorician; and Joannes Scholasticus, famous through his collections of canonical law. Among the Latins, we have to enumerate first the African Fathers: Fabius Victorinus; Augustine of Tagaste in Numidia, greatest dogmatist of the Western Church; Pope Gelasius I. (492—496), who finally fixed the canon of the Bible for the Rom. Church; and the Bishops Fulgentius, Junilius, and Facundus. Of Spaniards, we have Prudentius, poet; Paulus Orosius, whom Augustine used as his messenger to the East in his controversies with Pelagius. Of Gauls there are Hilarius Pictaviensis, Bp. of Poitiers about 350, the Athanasius of the West; Paulinus of Nola; Sulpitius Severus, friend of Martin of Tours; Vincent of Lerins, once a soldier, who wrote under the name of Peregrinus; Sidonius Apollinaris, Bp. of Clermont; Gennadius, author of an ecclesiastical literary history; Ennodius from Arles, who exerted himself to unite the Eastern and the Western Church; and Gregorius Turonensis, who wrote *Historia Ecclesiastica Francorum*, the basis of Frankish history. From other countries we have Sedulius, an Irishman; Joannes Cassianus, a Scythian; and Mercator, of unknown birthplace. We conclude with the Italians themselves: Lactantius Firmianus, the Christian Cicero; Julius Firmisius Maternus of Sicily; Ambrose, Metropolitane of Milan, who raised his see to such a power that it dared to resist Rome herself till the 12th c; Rufinus of Aquileia, defender of Origen against the charge of heresy brought against him in the West; Eusebius Hieronymus, undoubtedly most learned of all the Latin Fathers, and who mastered also the Greek and Hebrew languages, collected in Palestine the most valuable notes for the elucidation of the Scriptures, and also corrected the Latin edition of the Vulgate; Pope Leo I.; Boëthius; Aurelius Cassiodorus, whose *Historia Tripartita*, in 12 books, served for a thousand years as a compendium of ecclesiastical history; the two poets, Arator and Venantius Fortunatus; and Pope Gregory I. (590—604), regarded by Protestants as having first given the Western Church its peculiarly Rom. Cath. stamp by developing the idea of the Eucharist into a Theophany, and making it the centre of the worship. His works, especially his letters, are invaluable for the study of his own times, especially for the history of the conversion of the West.

On the mss. of the Fathers, see *Petri Lambecii Commentarii de Bibliotheca Casarea Vindobonensi*. The editors of the works of the Fathers are of two classes—those of the individual Fathers whose writings are the most voluminous and of highest dogmatical importance, and the general Patristic collections which comprise the writings of the less voluminous or minor Fathers. In the former class, the first place, beyond all dispute, belongs to the celebrated Benedic-

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tine editions, by the members of the great Maurist congregation of the French Benedictine order (see BENEDICTINES), of which community the task of editing the Fathers came to be considered as the recognized work. The Benedictine editions of the greater Fathers, with the exception of two or three, still maintain the very highest place in the estimation of the learned. Of the collections of the works of the Fathers, the most important are those of La Bigne, Galland, Rössler, Walch, Zimmerman, and Migne. Reference may be made also to Cardinal Mai's *Bibliotheca Patrum*, *Spicilegium Romanum*, and *Classici Auctores*, and to the *Spicilegium Solesmense* of the Benedictines of Solesme. Translation of the principal Fathers are numerous. For the chief works on the more important Fathers, see their several titles.

FATHER TOM: see BURKE, THOMAS NICHOLAS.

FATHIPOOR: see FUTTEHPUR.

FATHOM, n. *fāth'ūm* [AS. *fæthm*, a bosom, an embrace: Icel. *fadma*; Dan. *fadme*, to embrace: Icel. *fadmr*, a bosom, a fathom]: the length between the extremities of both arms extended; a measure of length of six ft., used chiefly in reference to marine soundings and in mines; in *OE.*, reach; penetration; depth: V. to reach; to master; to comprehend; to try the depth and to find it. FATH'OMING, imp. FATH'OMED, pp. -*ūmd*. FATHOMER, n. one who fathoms, penetrates into, or comprehends. FATH'OMABLE, a. -*ūm-ā-bl*, able to be measured in depth, etc. FATH'OMLESS, a. bottomless; that cannot be penetrated or comprehended. FATHOM-WOOD, n. in *naut.*, slabs and other offal or waste of timber sold at the yards by fathom lots, cubic measurement.

FATIGATE, v. *fāt'ī-gāt* [L. *fatigātus*, wearied, fatigued]: in *OE.*, to exhaust with labor; to fatigue; ADJ. in *OE.*, worn out by labor; fatigued. FAT'IGATING, imp. FAT'IGATED, pp.

FATIGUE, n. *fā-tēg'* [F. *fatigue*—from L. *fatigāre*, to weary or tire]: weariness; exhaustion of strength from mental or bodily labor; lassitude; toil; labor: V. to tire or weary; to exhaust with labor. FATIG'UING, imp.: ADJ. inducing weariness. FATIGUED', pp. -*tēgd'*: ADJ. wearied; harassed. FATIGUE-DUTY, the labors in which soldiers are often engaged distinct from the use of arms. FATIGUE-DRESS, the dress worn by soldiers in doing rough or laboring work. FATIGUE-PARTY, a number of soldiers on fatigue-duty.

FATIMIDES, *fāt'ī-mīdz*, or FAT'IMITES, -*ī-mīts*: Arabian dynasty which reigned for nearly two centuries over Egypt. Its founder was Mahadi-Obaidallah, A.D. 910-934. He asserted that he was descended from Fatima, daughter of the Prophet, and Ismael, a grandson of Ali. He thus won over to his side all the adherents of the widely diffused Ismaelites, an extravagantly schismatic sect of Mohammedans in Africa, and overthrew the race of the Aghlabides, who ruled at Tunis. His successor extended his dominion as far as Fez, and his descendant, Moëzz, in 970, conquered Egypt, expelled the reigning family, removed his court

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thither, founded Cairo, assumed the title of Caliph, thus proclaiming himself the lawful successor of the Prophet, and subdued Syria and Palestine. After the death of Moëzz, the F. maintained their high position for some time; but gradually degenerated, and resigned all the cares of government into the hands of their viziers. Their power then rapidly declined, and their vast territories melted away. In religious matters, the F., because they were raised to power by the followers of Ali, took upon themselves the protection of the Shiite sect, and the establishment of the Ismaelitic doctrines. Between 1002-21, the Caliph Hakem-Biamr-Allah persecuted the orthodox Mohammedans or Sunnites, as well as Jews and Christians. He founded an academy at Cairo, and endowed it largely, but connected with it a secret society for the diffusion of Ismaelitic opinions. In the first stages, the novice was shown the untenable nature of the precepts of the Koran; in the sixth, the advanced student found that religious legislation must give way to the claims of philosophy, in the seventh, a mystic pantheism was proved to be the true philosophy; and finally, in the ninth, the initiated discovered that he was not required to believe anything, and might do whatever he pleased. The system, with considerable modifications, found a home among that peculiar people the Druses (q.v.). After the death of Adhid, the last of the F., 1171, the founder of the dynasty of the Ayubides, Salâh-ed-din (Saladin), took possession of Egypt.

FATLING, FATNESS, FATTEN, FATTY, etc.: see FAT 1.

FATS, ANIMAL: solid oily substances in the animal body, concerning whose exact nature there is considerable difference of opinion among chemists. According to most chemists, they are composed of an admixture of three separate fats—margarine, stearine, and oleine, of which the two former are solid, and the latter fluid, at ordinary temperatures. Heintz, who has carefully studied these bodies, declares, however, that margarine is not a simple fat, but a mixture of stearine and palmitine (a solid fat occurring in palm-oil); and he considers human fat to be a mixture of stearine, palmitine, and oleine. For the chemical characters of these substances, see MARGARINE: OLEINE: PALMITINE: STEARIC ACID. The physiological relations of the fat remain to be considered.

Fat, usually inclosed in vesicles, is found very extensively in the animal kingdom. It is abundant in many larvæ, and occurs more scantily in most insects. It is found in the mollusca, and is comparatively abundant in all the divisions of the vertebrata. In most fish, it occurs throughout the body, but is abundant especially in the liver, where it is found in the hepatic cells, and not in its own characteristic vesicles. In reptiles, it exists chiefly in the abdomen. In birds, we find it especially about the peritoneum, and under the skin. In mammals, it is very generally diffused, but the greatest quantity is under the skin, in the omentum, and round the kidneys.—The quantity of fat in the human body varies considerably at different

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periods of life. In the earlier stages of fetal existence, there is scarcely any; in new-born children, there is usually a considerable quantity deposited under the skin, and the organism continues rich in fat till the age of puberty, when a marked diminution of the substance occurs. It again increases about middle life, and then occasionally occurs in great excess; for example, three or four inches of fat are frequently found under the skin of the abdomen in corpulent persons. Extraordinary deposits of fat in some particular part of the body are observed in certain races of men and animals. One of the most remarkable examples of this peculiarity is afforded by the Hottentot women, in whom the fat accumulates in the gluteal region to such an extent as to give a most remarkable prominence to that part of the body; and a somewhat analogous deposit exists in a variety of sheep (*Ovis steatopyga*, the fat-buttocked sheep), in which a large mass of fat, sometimes attaining a weight of 40 lbs., is developed on the buttocks, and takes the place of a tail.

The origin of the fat in the animal body must undoubtedly be referred chiefly to the fat taken with the food. It has, however, been proved by the most careful investigations on various animals submitted to the process of fattening, on bees fed with cane-sugar, or with honey containing scarcely any wax, and on the larvæ of the insects inhabiting galls, that the animal, like the vegetable organism, has the power of forming or producing fat, far more fat being found, in these experiments, in the body of the animal, than could be referred to the fat taken in the food. The excess must therefore have been formed either from the non-nitrogenous portion of the food, such as starch and sugar; or from the nitrogenous matters, such as fibrin, albumen, etc. In the case of the bees, it was distinctly proved that the fat was formed from sugar; while in the case of the larvæ of the gall-insect, it was similarly shown that it was produced from the starch which forms the interior of the gall in which the animal lives; and as we have no corresponding evidence of the convertibility of fibrin, albumen, etc., into fat (though such a conversion is not improbable), we must for the present regard the nitrogenous foods as the chief fat-formers next to fat itself.

The physiological value of the fats is due partly to their physical, and partly to their chemical characters. The uses of the fat deposited beneath the skin are, first, to protect the body from external shocks by a uniform diffusion of pressure through the whole adipose tissue; and, second, to keep up the heat of the body, by materially checking, through its very slight conducting power, the loss of free heat by radiation. This use of the fat is seen most clearly in some of the lower animals (the seal, whale, etc.), which are exposed to very low temperatures. Another physical use of fat is to promote the mobility of various organs. Hence, in cases of extreme emaciation, it always remains in the parts where motion is most essential, as the heart, and the orbit of the eye. Another of its important physical

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properties is that of rendering other bodies supple, and diminishing their brittleness. This use of fat is very conspicuous in the bones.

The chief chemical use of the fat is its power of exciting and supporting the animal heat. In the oxidation of the fats in the animal organism, whether the process be gradual or rapid, a large amount of heat must necessarily be liberated; and that they are oxidized, and for the most part reduced to carbonic acid and water, is evident, because they neither appear in any quantity in the excretions, nor, as a general rule, accumulate beyond a certain point in the organism. An accumulation of fat thus serves as a reservoir of combustible matter in time of need. This is evident especially in the case of hibernating mammals, for example, hedgehogs, in which an enormous quantity is deposited just before the hibernating period: during this period, it gradually disappears, its carbon being slowly consumed in the respiratory process, and keeping up the animal heat. Fat is, moreover, one of the most active agents in the metamorphosis of animal matter. Lehmann ascertained that a certain though small quantity of fat was indispensable to the complete gastric digestion of nitrogenous food, a fact confirmed by the observation that in experiments on artificial digestion, the solution of substances used as food is considerably accelerated by the presence of a little fat. The occurrence of fat in the milk and in the egg, as also in all highly cellular organs (as, for example, the liver), is a clear indication that this substance acts an important part in the process of cell-formation; and no animal-cell or cell-yielding plasma has ever been observed in which fat is not a constituent. An undue accumulation or increased growth of the fatty tissue gives rise to the condition known as Obesity (q.v.).

FATUOUS, *a.* *fāt'ū-ūs* [L. *fatūus*, silly, doltish: It. *fatuo*]: feeble in mind; silly; very defective in intellect: FATUITY, *n.* *fā-tū'ī-tī*, or DEMENTIA [F. *fatuité*]: weakness or feebleness in mind, consisting in the impairment or extinction of certain mental powers, or of all. Esquirol has quaintly said that the idiot and imbecile are the poor who have never been rich, but that the fatuous or demented are the rich who have been made poor. This impoverishment is sometimes so extreme, and the sufferer is so little influenced by consciousness as to lose a knowledge of his own existence; and so little influenced by impressions through the external senses, and by the instincts of the sensory ganglia, as to be equally ignorant of the existence of others. Life is vegetative merely. This deprivation may be partial or complete. It may appear as a weakening of sensibility. This is not the tolerance of powerful or painful impressions, or indifference to such, springing from abstraction or engrossment of the attention, but positive extinction of perception; or it may present the more common form of enfeeblement of intelligence, of memory; of the will, where the patient is apathetic, passive, plastic. The disease may involve the affections and the moral sense, and abrogate the power of decision, and all spontaneity of

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action and thought. Incoherence in ideas and words may be made to constitute another form, though generally regarded as a characteristic; whether it amounts merely to forgetfulness, or to confusion or irrationality, to inconsecutiveness and inability to express instincts and wishes. Delusions and hallucinations may co-exist with these conditions, but, like the real impressions received by this class of the insane, they are feeble, fugacious, and uninfluential. Under all these aspects, the essential element is privation of power; and this exists as a specific mental disease arising from obvious causes, unassociated with general alienation, acute in its nature, and rapid in its progress. It is most frequently the disease of youth, of the period of puberty, contemporaneous with growth, with debilitating and exhaustive processes, and depending, in all probability, as in the other forms, upon insufficient nutrition of the brain. At this age, the injury is repairable, and what may be designated juvenile dementia, has the rare distinction of being curable. More frequently, it is the sequel of mania, melancholia, and severe affections of the nervous system. The deterioration here arises from actual changes in the nervous structure, which render healthful nutrition impossible; so that, though mitigation, and sometimes to a marvellous extent, is within reach of treatment, recovery is believed impracticable. Again, it is an affection of old age; and though senile dementia may seem but an exaggerated state of dotage, it is accompanied by such marked physical changes, as to leave no doubt that it originates in circumstances differing widely from that gradual degeneration of the tissues which is evidenced by the 'second childishness and mere oblivion.' Lastly, this state may follow fever, when it is transitory, and generally of brief duration. Fatuity is one of the few morbid mental conditions recognized in the legal code as relieving from the consequences of criminal acts, and as disqualifying for the administration and disposal of property. Esquirol, *Des Malad. Ment.*, II. p. 219.

FAUBOURG, n. *fō'búrg* [F.—from mid. L. *foris-burgus*, the burg without or out of doors: comp. Gael. *fo*, under *borg*, or *burg*, a town or fort]: a suburb; a quarter outside the gates of a city.

FAUCES, n. *far' sēz* [L. *faucēs*, the upper part of the throat, a narrow inlet: It. *fauci*]: the upper part of the throat; the entrance of the gullet; in *bot.*, the gaping mouth of certain flowers, as the foxglove; in *conch.*, the opening into the first chamber of a shell. FAUCAL, a. *far' kal*, of or pertaining to the fauces or gullet; specifically, in phonology, applied to certain deep guttural sounds peculiar to the Semitic and some other tongues.

FAUCET, n. *far' sēt* [F. *fausset*, a short pipe—from *faulser* and *fausser*, to make a breach in anything]: a short pipe for inserting into a cask to draw off the liquor; OE. spelled *fasset*.

FAUCHIER, *fō-shā'*, LEON: 1803, Sep. 8—1854, Dec. 14; b. Limoges: French publicist and statesman. He studied

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at first philology and archeology; but about the period of the July revolution (1830), betook himself, with enthusiasm, to journalism and political economy. He became successively editor of the *Temps*, the *Constitutionnel*, and the *Courrier Français*, 1830-42, publishing many articles on political economy. In 1843, he began to write for the *Revue des Deux Mondes* a series of articles on the industrial condition of England, which appeared in 2 vols. 1845, under the title *Études sur l'Angleterre*, and constitute the most weighty of his productions, though Englishmen reckon the author greatly in error in many points. At the general elections of 1846, he was elected for the manufacturing city of Rheims. In the chamber of deputies, he voted with the dynastic opposition. A ready but not brilliant speaker, he came forward as one of the leading advocates of free trade, and published in the *Siècle*, and in the *Revue des Deux Mondes*, a number of vigorous essays on national economy. After the revolution of 1848, he was both in the constituent and in the legislative assemblies for the dept. of Maine. When Louis Napoleon was chosen pres., F. became first minister of public works, and subsequently minister of the interior; but when the pres. proposed to appeal to universal suffrage, F. resigned, and after the *coup d'état* he withdrew from political life. Many of his most valuable contributions to the science of politics are in the collection of the *Economistes et Publicistes Contemporains*, and in the *Bibliothèque des Sciences Morales et Politiques*.

FAUGH—FAURE.

FAUGH, int. *faw*, and **FOH**, *fō* [F. *pouah*, faugh: Gael. *fuath*, aversion]: interjections expressing disgust or aversion—similar to *fie* and *phew*.

FAULD, n. *fawld* [etym. doubtful]: tympanum or working arch of a furnace.

FAULKNER'S ISLAND: island belonging to N. Y., in Long Island Sound, off Guilford, Conn. It has a prominent light-house and a fog-bell.

FAULT, n. *fawlt* [F. *faulte*, or *faute*, a defect, an omission—from It. *falta*, a defect—from mid. L. *fallitā*, the act of failing—from L. *fallo*, I deceive: Sp. *fallar*, to lack]: an offense; a slight crime; an error or mistake; a defect; among *miners*, a fissure or break accompanied by a displacement of the strata on each side (see **DISLOCATION**, in Geol.). **FAULTED**, a. applied to strata fissured and displaced. **FAULTLESS**, a. free from defect or blemish. **FAULTLESSLY**, ad. *-lī*. **FAULTLESSNESS**, n. **FAULTY**, a. *fawlt'ī*, imperfect; containing defects. **FAULTILY**, ad. *-lī*. **FAULTINESS**, n. the state of being defective or erroneous. **TO FIND FAULT**, to express blame or dissatisfaction. **TO FIND FAULT WITH**, to blame. **AT FAULT**, puzzled; in a difficulty. **FAULTFINDING**, the habit of censuring or blaming frequently on grounds trivial or unjust. **FAULTFUL**, a. *-fūl*, in *OE.*, saturated with crime.—**SYN.** of 'fault': blemish; failing; imperfection; weakness; blunder; vice; foible; want; absence; default;—of 'faultless': blameless; spotless; stainless; perfect.

FAUN, n. *fawn* [L. *Faunus*, one of the gods of the fields or woods]: a woodland deity, represented usually with the legs of a goat; a satyr: named from Faunus, a mythical king of Italy, who instructed his subjects in agriculture and the management of flocks, and was afterward worshipped as the god of fields and of shepherds. The festival of the *Faunalia*, Dec. 5, referred to his protection of agriculture and cattle. Fauna was his female complement. He was worshipped also as a prophetic divinity. As deity of the woods and of flocks and herds, he corresponds to the Greek Pan: the idea also arose of a plurality of Fauni or Fauns, like the Greek Satyrs, who were represented as monster deities with short horns, pointed ears, tails, and goats' feet, and to whom all terrifying sounds and appearances were ascribed. **FAUNA**, n. *fawn'ā*, all the animals peculiar to a country, area, or period. Thus, we speak of the fauna of Great Britain, the recent fauna, the fossil fauna, the fauna of the Eocene period or formation, etc. The term bears the same relation to the animal kingdom that *Flora* does to the vegetable. In the fauna of any country are included only those animals indigenous to it, not those which have been introduced. **FAUNIST**, n. *fawn'ist*, a naturalist.

FAURE, *fōr*, **FRANÇOIS FÉLIX**: president of the French republic: 1841, Jan. 30—; b. Paris. He was elected pres. 1895, Jan. 17. During the Franco-German war, 1870-71, he organized a battalion of mobile guards, and afterward went to Paris with the Havre firemen to stop the incendiary fires started by the communists. He

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was elected deputy from Havre to the chamber 1881, and entered as under-sec. of commerce and colonies in the cabinet which Gambetta formed the same year; occupied the same position in the Ferry cabinet 1883-85, and the Tirard cabinet 1888; and afterward was elected deputy, 1889 and 93. Until 1894, May, he was one of the vice-presidents of the chamber, and was then made minister of the navy in the Dupuy cabinet, which was overthrown by the chamber. The principles advocated by Gambetta and made triumphant by Sadi-Carnot have marked the political course of F. Unlike his predecessor in office, however, F. is regarded, not as a champion of capitalists, but as a representative of the common people, the *bourgeoisie* whose ancestors made the revolution of the 18th c.; and he has shown no disposition to impose upon the people his private views of government. Most of his life has been spent at Havre, where he was a commission and shipping merchant, and at one time pres. of the chamber of commerce. His wealth was accumulated by industry and thrift. He is a good English scholar, and well versed in the study of economical questions; has published important works and reports on the commercial and other interests of France. His election was regarded as a triumph of the moderate republicans.

FAURIEL, *fō-re-ël'*, CLAUDE CHARLES: 1772, Oct. 21—1844, July 15; b. St. Etienne, dept. of Loire: French philologist, historian, and critic. He studied at the College des Oratoriens at Tournon, afterward at Lyon, and 1799, was appointed to a situation under Fouché; but destitute of political ambition or predilections, and passionately fond of learned studies, F. resigned his office 1802, and turned to literature. He made himself familiar with Sanskrit, Arabic, and the treasures of classical antiquity and of the middle ages; and though he did not write much, yet what he wrote was of great value. Renan may exaggerate when he affirms that F. 'put in circulation the greatest number of ideas' of any contemporary writer; but even the Germans allow that in many points of literary history, criticism, and philology, F. was 20 years in advance of his age. After the July Revolution, he was appointed prof. at the Sorbonne; in 1836, he published his chief work, *Histoire de la Gaule Méridionale sous la Domination des Conquérants Germains* (4 vols. Paris), one of the best specimens of historical investigation and art in modern times. Worthy of notice, also, particularly for its remarkable historical introduction, is his edition of the Provençal rhymed chronicle, *Histoire de la Croisade contre les Hérétiques Albigeois* (Paris 1837). One of F.'s best known essays is that on the origin of the Epic of Chivalry in the middle ages. He died at Paris. Two years after his death appeared a collection of his professorial lectures, *Histoire de la Poésie Provençale* (3 vols. Paris 1846), in which F. endeavors, with great erudition and originality of criticism, to show that the Provençals must be attributed the composition and primitive development of the greater portion of the romances of chivalry, including those which describe the contests of

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the Christians and Moors in Spain, and those which form the Charlemagne cycle, thus finding the origin of the old Spanish and German poetry on the soil of France. These views have found some strong opponents.

FAUSSE BRAIE, or **BRAYE**, *fōs'brā* [*F. fausse*, false, *braie*, breeches]: in *fortification* a low rampart encircling the body of a place, and raised about three ft. above the level ground; mostly discarded by modern engineers, except in front of curtains, under the name of *Tenailles* (q.v.). The French engineers gave this title to the work as an adaptation from the Italian term *Fossa Brea*, which had its origin from the F. B. being commonly in the ditch, in front of the main wall. The F. B. had the advantage of giving an additional tier of guns for defensive purposes; but the still greater disadvantage of affording facilities for the scaling of the parapet.

FAUSSE RIVIÈRE, *fōs rē-vē-är'* (*False River*): lake of Louisiana, notable as an index of the physical character of the country. Till about a century and a half ago, it was a channel of the Mississippi—a fact which probably is expressed in its name. Here, as in other alluvial formations, the beds of the running waters are undergoing incessant changes.

FAUST, *foʊst*, **DOCTOR**: according to tradition, a celebrated dealer in the black art, during the latter half of the 15th, and the beginning of the 16th c.; frequently confounded with Johann Faust (or Fust); b. Knittlingen, in Würtemberg: or, as some say, at Roda near Weimar. He is said to have studied magic at Cracow. After having spent a rich inheritance left him by his uncle, F. is alleged to have made use of his 'power' to raise or conjure up the devil, with whom he entered into a contract for 24 years, obtaining during that time his fill of earthly pleasure, but at its termination surrendering body and soul into the hands of the Great Enemy. The devil gave him an attendant spirit or demon, called Mephistopheles—other names are given by the later traditionists,—with whom he travelled about, enjoying life in all its forms, and astonishing people by working wonders, till he was finally carried off by the Evil One, who appeared in terrible guise, between twelve and one o'clock at night, at the village of Rimlich, near Wittenberg, though several other places lay claim to that very questionable honor. Some have doubted, considering the monstrously mythical form in which his career has come down to us, whether such an individual as F. ever existed; but it is now generally believed that there was a basis of fact, on which tradition has built its grotesque superstructure. Gorres, indeed, asserts that one George Sabellicus, who disappeared about 1517, is the real F.; but Philip Melancthon—the man of all the reformers whose word in regard to a matter of fact would most be trusted—says that he had himself conversed with Dr. Faustus. Conrad Gesner (1561) is equally positive; and Luther, in his *Table Talk*, speaks of Dr. F. as a man lost beyond all hope. The opinion that prevails, reckoned intrinsically the more probable, is that some man of this name, possessed of varied

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knowledge, may possibly have practiced jugglery (for all the wandering savans of the middle ages had a touch of the quack about them), and thus have been taken by the ignorant people for a dealer in the black art, and one who maintained a secret and intimate relation with evil spirits. His widely diffused celebrity not only occasioned the wonders worked by other so-called necromancers of an earlier age—Albertus Magnus, Simon Magus, and Paracelsus—to be attributed to him, but likewise many ancient tales and marvellous legends were gradually transferred to him, till he appears finally the very hero of magicians. But while, on the one hand, the narrative of F.'s marvels afforded amusement to the people, on the other, they were made use of for instruction by the clergy, who pointed out, in the frightful fate of F., the danger of tampering with the 'black art;' and the abominableness of a life sunk in sensuality and vice. The myth of F. has received a manifold literary treatment. First come the *Volksbücher* (or people's books), which record F.'s enterprises and feats: the oldest known appeared at Frankfort 1588. Then came an 'improved' edition of the same, by Widmann, *Wahrhaftige Historien von denen gräßlichen Sünden Dr. Joh. F.'s* (True History of the Horrible Crimes of Dr. John F., Hamb. 3 vols. 1599); and 1695, a work was published at Nürnberg by Pfitzer, based upon that of Widmann. The oldest of these books was translated into all languages of civilized Europe. Imposters also published books of magic under the name of F., such as *Faust's grosser und gewaltiger Höllenzwang* (Faust's Great and Potent Book of Spells), *Fausten's Miraculokunst* (Faust's Art of Performing Miracles), and *Dreifache Höllenzwang* (The Threefold Book of Spells). These wretched productions are filled with meaningless scrawls and figures, interspersed with texts from the Bible scandalously misapplied; but in the belief of the vulgar, they were supposed capable, when properly understood, of accomplishing prodigies. That the poetical art should in due time have seized on a subject affording so much material for the fancy, was inevitable; consequently German literature abounds in elegies, pantomimes, tragedies, and comedies on Faust. Since the end of the 17th c. the *Puppenspiel* (Puppet-show) of Dr. F. (published first at Leipsic 1850) has been one of the most popular pieces in Germany. It forms the transition from the rude magic tales concerning F., to the later philosophic conception of the Faust-myth, which has become the most perfect poetical expression of the eternal strife between Good and Evil in the soul of man. The first writer who treated the story of F. dramatically was the English writer Christopher Marlowe, about 1600 (German translation by W. Müller, Berlin 1818); but the grandest work on the subject is Goethe's *Faust*, the first part of which appeared under the title of *Dr. F., ein Trauerspiel* (Leip. 1790), and afterward in a remodelled form, *F., eine Tragödie* (Tübingen 1808). The second part was published after Goethe's death, Stuttgart 1833. Besides may be mentioned Lessing's masterly fragment, *F. und die Sieben Geister* (F. and the Seven Spirits),

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G. F. L. Müller's *Dr. F.'s Leben* (Dr. F.'s Life, Manh. 1778), and Klinger's *F.'s Leben, Thaten, und Höllenfahrt* (F.'s Life, Doings, and Descent into Hell; Petersb. and Leip. 1791). The plastic art also has found a fit subject in Faust. In Auerbach's cellar at Leipsic, where F. is said to have performed many of his feats, are two rude daubs of date 1525, representing F. and Mephistopheles riding out of the cellar on a wine-barrel. Rembrandt and Christoph von Sichem have illustrated the story of F., and, in modern times, Cornelius and Retzsch have done the same. See Peter's *Die Literatur der Faustsage* (3d ed. 1857); Engel's *Das Volksschauspiel Dr. F.* (1873).

FAUST (or FUST), JOHANN: d. 1460: chief promoter of the invention of printing, a rich citizen of Mayence: see GUTENBERG.

FAUSTINA, *faws-ti'na*, ANNIA GALERIA (*Faustina Senior*): wife of the Roman emperor, Antoninus Pius: died A.D. 141. Also, her daughter, FAUSTINA JUNIOR, wife of the Roman Emperor Marcus Aurelius Antoninus (successor to Antoninus Pius): d. 175 at a village near Mount Taurus. Both, but particularly the younger, were notorious for the profligacy of their lives, which their exemplary husbands in vain endeavored to check. After their deaths, institutions for the relief of poor girls were founded both by Antoninus and Marcus Aurelius in memory of them, and were called '*puellæ alimentariæ Faustine.*' Marcus Aurelius, in his Meditations, speaks highly of his wife; and an attempt has been made by Wieland to defend her against the imputations of the historians of the emperors.

FAUSTINUS I., *faws-ti'nūs*: Emperor of Hayti, known, before his elevation to the throne, as Faustinus Soulouque: 1789-1867, Aug. 6 (reigned 1849-1859); b. San Domingo: a negro originally in very humble circumstances. In his earlier years, he acted as servant, afterward as adjutant, to Gen. Lamarre. He subsequently served under Presidents Petion and Boyer, and by the latter was raised to the rank of captain. After 1844, when the Haytian Republic—of which Gen. Boyer was then president—was dissolved, a struggle for the supreme power ensued, in which F. took an important part. In 1847 he was appointed by the senate pres. of the republic. A dreadful massacre of the mulattoes in Port-au-Prince took place at his instigation, 1848, Apr. 16, which, with similar measures, struck terror into the hearts of his opponents. In 1849, Aug., he had himself proclaimed Emperor of Hayti, a title which he held for about ten years; but a revolution having broken out 1858, and a republic having been declared, F. was forced to abdicate, 1859.

FAUTEUIL, n. *fō-tāl'* [F.—from OF. *fauudetueil*—from mid. L. *faldistōlium*]: an arm-chair, generally highly ornamented; a president's chair: see FALDSTOOL.

FAUVETTE, *fō-vèt'*: French name, partially adopted in English, for some of the little song-birds of the family *Sylvidae* or Warblers, having straight slender bills slightly

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compressed in front, the ridge of the upper mandible curving a little towards the tip, and the legs not long. They mostly belong to the genus *Curruca*, as the Blackcap, the Pettychaps, or Garden Warbler, the Whitethroat, etc., and to the genus *Salicaria*, as the Sedge Warbler, the Reed Warbler, etc. The Dartford Warbler (*Melizophilus Provincialis*), also is called Fauvette. They are all very lively little birds, continually flitting about in pursuit of insects, mostly frequenting bushy places; and some of them, particularly those of the genus *Salicaria*, preferring watery situations where reeds abound.

FAUX-BOURDON, n. *fū-bôr-dông* [F. *faux*, false; *bourdon*, a drone bass, a series of similar notes or a holding note as an accompaniment to the melody]: in *mus.*, a sort of harmony used by the old composers, and consisting of thirds and sixths added to a canto-fermo.

FAUX-JOUR, n. *fū-zhôr* [F. *faux*, false; *jour*, day, light]: false or contrary light; in *art*, false light; a term denoting that the light in which a picture is hung falls on it in a different direction from that in which the painter has represented it as coming.

FAUX-PAS, n. *fū-pâ* [F. *faux*, false; *pas*, step]: false step; mistake; breach of propriety, manners, or morality; a lapse from chastity.

FAVARA, *fâ-vâ-râ*: town of Sicily, in the s. of the island, province of Girgenti, four m. s.e. of the town of Girgenti. It has rich sulphur-mines. Pop. 16,000.

FAVART, *fâ-vâr'*, CHARLES SIMON: 1710, Nov. 13—1793, May 12; b. Paris: French dramatist. He became known by his *La Chercheuse d'Esprit*, performed 1741. In 1745 he married Mademoiselle Duronceray, herself a dramatic writer of some note and a singer of remarkable talent, and in the same year became director of the *Opéra Comique*. The fine taste and judgment of F. and his wife soon obtained for their theatre great reputation. It was they who made the first attempt to harmonize the costume of the actors and actresses with their impersonations, and to put a stop to the ridiculous practice of decking out soubrettes and country-girls in the attire of court-ladies. So powerful, however, was the opposition excited by the jealousy of the other theatres, that the *Opéra Comique* was closed in the first year of its existence. After some time spent with Maréchal de Saxe during his campaign in Flanders, F. and his wife (who d. 1772) returned to Paris, where the former continued to write operas. F.'s success as a writer was very great: he may be reckoned the father of the comic opera, and the happy successor of Le Sage, Piron, etc. The number of his pieces is about 60, of which the most celebrated are *Comment l'Esprit vient aux Filles*, *Le Coq du Village*, *Bastien et Bastienne*, *Ninnette à la Cour*, *Les Trois Sultanes*, and *L'Anglais à Bordeaux*. His works have been published several times. An edition in 10 vols. was published, Paris 1810, under the title of *Théâtre de Monsieur et Madame Favart*. A very interesting book, *Les Mémoires et la Correspondance de Favart*, giving pleasing glimpses of

FAVELLA—FAVOR.

the literary and theatrical world of the 18th c., was published by his grandson, Paris 1809.

FAVELLA, n. *fä-věll'lä* [L. *favus*, a honeycomb: perhaps L. *favilla*, hot cinders or ashes], in *bot.*, a kind of conceptacle among the algæ. **FAVOSE'**, a. *-vös'*, in *bot.*, honeycombed; cellular. **FAVUS**, n. *fä'vüs*, a disease of the skin, commonly known as scaldhead. **FAVOSITES**, n. *fäv'ô-sīts*, in *geol.*, genus of lamelliferous corals, found in Silurian, Devonian, and Carboniferous strata. They were social corals, closely packed together, no space being left between the walls of the different corallites. As in the other palæozoic corals, the lamellæ are developed in multiples of four, and the older portion of the stony base is partitioned off by horizontal tabulæ. **FAV'ULA'RIA**, n. *-ü-lä'rä-ä*, in *geol.*, a genus of coal-measure stems whose leaf-scars resemble the arrangement of a honeycomb: see **SIGILLARIA**.

FAVEOLATE, a. *fa-vě'o-lüt*: formed like a honeycomb; alveolate; cellular.

FAVEROLE, n. *fäv'er-öl* [F. *faverolle*, a haricot bean, dim. of L. *faba*]: in *bot.*, water dragons, *Calla pallustris*.

FAVERSHAM, *fäv'er-sham*: municipal borough and seaport in the n. of Kent, England; on a navigable creek, opposite Sheppey Isle, 8 m. w.n.w. of Canterbury. It consists chiefly of four streets in an irregular cross. It has a valuable oyster-fishery, employing 200 to 300 persons. It sends much agricultural produce to London by hoys. The creek admits vessels of 150 tons. In the vicinity are some of the most important gunpowder factories in the kingdom. Under the name of Favresfield, it was a seat of the Saxon kings, where Athelstan, 930, held a Witenagemôte. It has the remains of an abbey founded by King Stephen, where he and his queen, Matilda, are buried. St. Crispin is said to have been apprenticed to a shoemaker here. Near F. are some chalk caverns, with columns. In 1880, 13,047 vessels, of 637,447 tons, entered and cleared the port. Pop. (1881) 8,756; (1891) 10,478.

FAVIGNANA, *fä-vën-yä'nä*: chief of the Ægades, a group of islands in the Mediterranean, off the w. coast of Sicily. It is six m. from the Sicilian shore, and is about six m. long, with an average breadth of two miles. It has a town of the same name, with two castles, and a pop. about 5,000. F. is fruitful, has good pasture, and produces excellent wine.

FAVILLA: see **FAVELLA**.

FAVONIAN, a. *fä-vö'nä-an* [L. *Favonius*, the west wind]: pertaining to the west wind; hence, gentle, favorable, prosperous.

FAVOSITES, **FAVULARIA**, **FAVUS**, etc.: see **FAVELLA**.

FAVOR, or **FAVOUR**, n. *fä'vër* [F. *faveur*—from L. *favorem*, good-will—from L. *favĕō*, I befriend: It. *favore*]: kind regard; good-will; grace; support; patronage; a kind act or office; a gift; bows of white satin ribbons, as a wed-

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ding-favor; distributed at marriages in some countries, usually pinned on the breast of all concerned, attendants and postilions included. The favors of those more immediately interested are sometimes enriched with orange blossom. This is an old usage, connected with the love-knot of ancient northern nations; it is almost the only remaining token of merriment in the nuptial ceremonial, and is itself beginning to disappear.—See Brand's *Popular Antiquities*, edited by Ellis, article 'Bride Favours'; something given to be worn, as ribbons; anything worn as a token; in *OE.*, feature; countenance: V. to assist; to befriend; to afford advantages for success. FA'VORING, imp.: ADJ. countenancing; facilitating. FA'VORED, pp. *-verd*, treated with favor; featured [*well* or *ill*]: in *OE.*, resembled in any way. FAVOREDNESS, n. *fä'verd-nēs*, appearance good or bad. FA'VORABLE, a. *-vér-ä-bl* [*F. favorable*]: friendly; kind; propitious. FA'VORABLY, ad. *-ä-blī*. FA'VORABLENESS, n. *-bl-nēs*. FA'VORINGLY, ad. *-lī*. FA'VORER, n. *-er*, one who. FA'VORITE, n. *-vér-īt*, one preferred before others: ADJ. esteemed; beloved; preferred. FA'VORITISM, n. *-izm*, the disposition to favor or promote the interest of one before another. FA'VORLESS, a. destitute.—SYN. of 'favor, n.': kindness; present; benefit; countenance; lenity; promotion; befriending; benevolence; good-will; token; partiality; bias; letter; epistle.

FAVRE, *fävr*, JULES CLAUDE GABRIEL: 1809, Mar. 21—1880, Jan. 19; b. Lyon: French advocate and minister. He was son of a merchant, studied for the bar, and passed at Lyon 1830. His political opinions were always intensely republican, and when pleading in numerous political law-suits, F. frequently placed the state solicitors, and even the judges, in a very embarrassing position, by the boldness of his sentiments. As the defender of the *Mutuellists* at Lyon 1831, he was in danger of losing his life; this, however, did not prevent him from defending those who had been impeached in April, and commencing his speech with *Je suis Républicain*. From 1834, F. was a member of the Paris bar. In the revolution of 1848, Feb., he was home sec., in which capacity he wrote the notorious circular for which Ledru-Rollin's administration was so severely reproached, investing the commissioners of the republic with dictatorial authority in the provinces. He was active as a member of the committee of foreign affairs. After the election of Dec. 10, F. showed himself a persistent antagonist of Louis Napoleon, and after the flight of Ledru-Rollin, became the orator of the Mountain. The *coup d'état* closed his political career at this time. He refused to take the oath of fidelity to the imperial government, and betook himself again to his profession. In 1858, he defended Orsini, on his trial for a conspiracy to murder. In the same year, however, he became a member of the legislature. In 1870, Sep., after the downfall of the empire, he was appointed minister of war, and carried on negotiations with Count Bismarck. He resigned office 1871, July, and resumed practice at the bar. F. was greatest in political repartee, and though long accus-

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tomed to public strife, his language was noted for Attic elegance.

FAVUS, *fā'vus* [see **FAVELLA**]: disease of the skin, chiefly of the hairy scalp, characterized by yellowish dry incrustations more or less roundish, and often cup-shaped, composed of the sporules and mycelia (q.v.) of a vegetable growth belonging to the order of Fungi (q.v.). The disks of *F.* are produced with great rapidity, and spread rapidly, if not attended to at the first, over the whole scalp, destroying the bulbs of the hair, which becomes very short and thin, and then falls out altogether. *F.* is disgusting and unsightly, but hardly dangerous; it is contagious, but spreads only where cleanliness is greatly neglected, and is therefore almost unknown among the better classes. It is far more common among children than among adults, and seems more frequent in Scotland than in England, and on the continent than in either England or Scotland. The cure is sometimes attempted by a variety of medicated and simple ointments, and by pulling out the hair by the roots, or *epilation*, as it is called; but it seems hardly possible in inveterate cases to be rid of the disease without a very long persistence in habits of most scrupulous cleanliness; therefore the cure is seldom permanent, though easily attained for the time. *F.* is almost always followed by permanent baldness of the parts affected; unlike ringworm (q.v.), which is a minor disease of the same order.—The Favus fungus, *Achorion Schænleini*, is nearly allied to the fungus which has recently proved so destructive to vines, and has by some botanists been placed in the same genus, *Oidium*.

FAWCETT, *faw'sèt*, EDGAR: author: b. New York, 1847, May 26. He graduated at Columbia College 1867, and has published *Short Poems for Short People* (1871); *Purple and Fine Linen* (1874); *Ellen Story* (1876); *Poems of Fantasy and Passion* (1877); *A Hopeless Case* (1881); *A Gentleman of Leisure* (1882); *An Ambitious Woman* (1883); *Song and Story, Tinkling Cymbals, The Adventures of a Widow* (1884) *The Bunting Ball, The New King Arthur*, opera libretto (1884,5); *Social Silhouettes* (1885); *Romance and Revery* (1886); and *The House at High Bridge* (1887).

FAWCETT, HENRY, M.A., D.C.L.: 1833–1884, Nov. 6, b. Salisbury, England: economist. He graduated at Trinity Hall, Cambridge, 1856; lost his eyesight by an accident 1858; was appointed prof. of political economy at Cambridge 1863; was elected member of parliament 1865, 68, 74; appointed postmaster-gen. in Gladstone's administration 1880, Apr.; and had his great scheme of post-office annuities put in general operation 1884, June. While postmaster-gen. he introduced many reformatory measures, and proved himself progressive and efficient. Among his numerous works are: *Manual of Political Economy* (1863); *Economic Position of the British Laborer* (1865); *Pauperism* (1871); and *Free Trade and Protection* (1878). He was appointed a privy counselor 1880, received the degree D.C.L. from the Univ. of Oxford, 1880, and that of doctor of

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political economy from the Univ. of Würzburg 1882.—His widow, MILLICENT GARRETT F., is author of *Political Economy for Beginners* (1869), *Tales in Political Economy*, and jointly with her husband of a volume of essays and lectures on political and economical subjects.

FAWKES, *fawks*, GUY (properly GUIDO): 1570-1606, Jan. 31; b. of a Prot. family in Yorkshire, England: head of the conspiracy known by the name of the Gunpowder Plot. He became a Rom. Catholic at an early age, and served in the Spanish army in the Netherlands. Inspired with fanatical zeal for his new religion, on his return to England, he entered into a plot with several Rom. Cath. gentlemen for blowing up the king, his ministers, and the members of both houses at the opening of parliament, 1605, Nov. 5. Guy F. was taken with the burning match in his hand, tried, and after having been put to the torture, was publicly put to death. In remembrance of this event, in most large English towns, particularly in London, a grotesque figure, stuffed with straw, is carried about the streets on Nov. 5, and finally committed to the flames. A

Guido fawkes

G. m. do —

Guy Fawkes's signature before and after torture.

political and religious signification was again imparted to this custom by what was called 'the papal aggression' 1850, when the figure of Cardinal Wiseman (q. v.) was substituted for that of Guy Fawkes.

FAWN, n. *fawn* [OF. *faon*, the young of any animal, then a doe or fawn—from mid. L. *fatonus*, a little offspring—from L. *fetus*, offspring, progeny]: a young deer. FAWN, or FAWN-COLORED, of a light-brown color like a fawn. FAWN'ING, imp. bringing forth a fawn.

FAWN, v. *fawn* [Goth. *faginon*, to rejoice: AS. *fægen*, joyful: Icel. *fagna*, to rejoice: comp. Gael. *fàn*, to dance attendance]: to carry to excess the appearance of pleasure; to court favor; to flatter meanly; to cringe. FAWN'ING, imp.: ADJ. flattering by cringing and meanness. FAWNED, pp. *fawnd*. FAWN'ER, n. one who. FAWN'INGLY, ad. -lì, in a cringing manner.

FAWSONT, a. *faw'sönt* [Gael. *fasanta*, customary, respectable]: in *Scot.*, respectable; in accordance with custom and fashion. FAUSONED, a. *faw'sönd*, in *OE.*, fashioned.

FAY, n. *fä* [F. *fée*, a fay, an elf (see FEY)]: a fairy; an elf.

FAY, n. *fä* [F. *foi*, faith—from L. *fidem*, faith]: an OE. spelling for FAITH, which see.

FAY, v. *fä* [Ger. *fügen*; Sw. *foga*; AS. *fegan*, to join

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together]: in *ship-building*, to join two pieces of timber close together. FAY'ING, imp. FAYED, pp. *fäd*.

FAY, *fä'ě*, ANDRÁS: 1786–1864; b. Kohany, in the county of Zemplén: Hungarian author. He studied philosophy and law at the Prot. college of Sárospatak, and then applied himself to literary pursuits. After two vols. of poetry, appeared the collection of Fables (*Mesék*, Vien. 1820), which gave him repute. The fables are like those of Phædrus and La Fontaine, but in prose. Richness of invention, simplicity of design, and truth of character, are evident in this work. Among F.'s dramatic works are the tragedy, *The Two Bathorys* (*A Két Báthory*, Pesth 1827); the comedies, *Ancient Coins* (*Régi Pénzek*), and *Hunters in the Matra* (*Mátrai Vadászok*). The novel, *The House of the Béltékys* (*A' Béltéký-ház*, Pesth 1832), is rather didactic, but exhibits many features of Hungarian domestic life. F. was a constant contributor to literary and scientific periodicals, and had his share in some of those pamphlets by which great social questions, for instance, female education, savings-banks, etc., were brought to a successful issue in Hungary. In reading F.'s works, we are frequently reminded of Dean Swift. F. was foremost among the leaders of the liberal opposition in the county sittings of Pesth 1825–40; but on the appearance of Kosuth, the strides of public life growing more and more rapid, F. gradually retired from political controversy. The first savings-bank of Hungary (at Pesth) was entirely F.'s work. His literary works were published in eight vols. Pesth, 1843–4.

FAY, *fä*, JONAS: 1737, Jan. 17–1818, Mar. 6; b. Hardwick, Mass.: patriot. He was educated for a physician, but spent the greater part of his life in public service. He was an army surgeon under Col. Ethan Allen at Ticonderoga; member of the convention which declared Vt. an independent state, and author of the declaration 1777; sec. of the state constitutional convention 1777, July; member of the council of safety; member of the state council 1778–85; judge of the supreme court 1782, and of probate 1782–87; and state agent of Vt. in congress 1777, Jan., 1779, Oct., 1781, June, 1782, Feb.

FAY, THEODORE SEDGWICK: author: b. New York, 1807, Feb. 10. He studied law, but abandoned it to become associate editor of the *New York Mirror* with George P. Morris and Nathaniel P. Willis, 1828. He spent several years in European travel, was sec. of the American legation at Berlin 1837–53, and U.S. minister-resident at Berne, Switzerland, 1853–61. He has published a notable series of papers on Shakespeare, a story of New York life, *Nor-man Leslie*, which was dramatized and played with success, and *Dreams and Reveries of a Quiet Man* (1832); *The Minute Book* (1833); *Sydney Clifton* (1839); *Countess Ida* (1840); *Hoboken, a Romance* (1843); *Robert Rueful* (1844); *Ulric, or the Voices*, poems (1851); *Views of Christianity* (1856); *History of Switzerland* (1860); *Great Outlines of Geography* (1867); and *First Steps in Geography* (1873).

FAYAL—FAYE'S COMET.

FAYAL, *fī-âl'*: one of the most important of the Azores (q.v.); area about 69 sq. m. It is very fertile, and has a dense population. In its centre is a mountain 3,000 ft. in height; and on its s.e. coast a convenient bay with good anchorage. Its principal town, Horta, is on this bay, lat. 38° 30' n., and long. 28° 41' w. Pop. of the island (1881) 26,264.

FAYALITE, *n. fā'ă-līt* [from *Fayal*, one of the Azores; Gr. *lithos*, a stone]: a pure iron chrysolite of a greenish or brownish-black color.

FAYBERRY, *n. fā'bēr-rĭ*: the gooseberry.

FAYERWEATHER, *fär'wèth-ér*, **DANIEL B.**: merchant and philanthropist: 1821–1890, Nov. 15; b. in Stepney, Conn. At the termination of an apprenticeship with a farmer, he learned the shoemaker's trade, in Bridgeport, Conn., and afterward became a pedler of tinware, in Virginia, often taking pelts for payment. Returning to his trade in Bridgeport, he remained there till 1854, when he removed to New York, entering the employ of Hoyt Bros., dealers in leather. In 1870, the firm was dissolved, and later the business was conducted under the firm-name of Fayerweather & Ladew. In financial circles Mr. F. was noted for strict commercial honor. His habits were retiring and economical, but he was judiciously charitable. He was so little known outside of his circle of business acquaintances and personal friends that the publication of his will, bequeathing more than \$2,000,000 to various charitable and educational institutions, and directing that \$3,000,000 more be placed in the hands of executors for distribution among public institutions according to private instructions, attracted much attention. Among his bequests were: \$25,000 to the Presbyterian Hospital, \$25,000 to St. Luke's Hospital, \$25,000 to the Manhattan Eye and Ear Infirmary, \$10,000 to the Woman's Hospital, \$10,000 to Mount Sinai Hospital, all in New York; \$200,000 to Yale Univ. and \$100,000 to its Scientific School, \$200,000 to Columbia Univ., \$200,000 to Cornell Univ., \$100,000 to Bowdoin College, \$100,000 to Amherst College, \$100,000 to Williams College, \$100,000 to Dartmouth College, \$100,000 to Wesleyan Univ., \$100,000 to Rochester Univ., \$100,000 to Hamilton College, \$100,000 to the Univ. of Virginia, \$100,000 to Lincoln Univ., \$100,000 to Hampton Univ., \$100,000 to Maryville College, and \$50,000 each to the Union Theol. Seminary, and Marietta, Lafayette, Wabash, Adelbert, and Park colleges. In 1891, his widow began legal proceedings to oppose the probating of the will. She did not object to the public bequests, but was not willing to have the executors receive \$3,000,000. Subsequently the suit was withdrawn, on an agreement to divide the residuary estate between Yale, Harvard, Princeton, Columbia, and the Woman's and Presbyterian hospitals in New York.

FAYE'S COMET: discovered by Hervé Auguste Étienne Albans Faye, 1843, Nov. 22, in the constellation of Orion. It had a short tail and bright nucleus, and has since been

FAYETTEVILLE—FAYÛM.

seen 1850, Nov. 28, 1858, Sep. 12, 1869, and late in 1888, but at no time has it been visible to the naked eye. Leverrier computed its entrance into the solar system about 1747, and established its mean distance from the sun at 3·8118 times that of the earth, eccentricity ·5576, inclination $11^{\circ} 22' 7''$, period 7·414 years, and motion direct. Its discoverer was born in Saint Benoit, Indre, France, 1814, Oct. 5, studied astronomy with Arago, became prof. of astronomy 1873, and director of the national observatory at Paris 1878, Jan.

FAYETTEVILLE, *fī-ēt-vīl*: city of N. Car.; on the left bank of Cape Fear river, about 140 m. from its mouth. F. marks the head of natural navigation of the river; though by locks and dams it communicates with the upper basin of the river. The interior sends down coal, and the neighborhood is covered with forests of pine, traversed by 350 m. of plank-road, and yielding tar and turpentine, of which latter there are several distilleries. Cotton and flour manufacture are largely carried on by water-power. The extensive arsenal of F. was seized by the Confederates 1861, and destroyed by Sherman 1865. Pop. (1880) 3,485; (1890) 4,222.

FAYÛM, *fī-ôm'*: Egyptian province, surrounded, in the form of a basin, by the Libyan Desert, and connected merely by a narrow valley with that of the Nile; between lat. 29° – 30° n., and 30° – 31° e. This peculiar depression of the desert extends about 30 m. from n. to s., and about 40 m. from e. to w., its lowest point lying 100 ft. below the banks of the Nile at Benisuef. F. is one of the most fertile provinces in Egypt; producing, in addition to the ordinary useful plants of the country, roses, apricots, figs, vines, olives, etc. in great quantities. This fertility, in a province the soil of which is naturally arid and sandy, is the result of irrigation. A canal from the Nile was, at an early period, dug westward through a gorge in the Libyan hills which here skirt the w. bank of the Nile, and after dividing into numerous branches, lodged its waters in a depression in the n.w., thus forming, it is said, the Lake Mœris (q.v.). The anc. capital of the province, called Krokodilopolis, and later Arsinoë, stood on the e. shore of Lake Mœris; and upon its ruins stands Medinet-el-Fayûm, chief town of the province, with pop. about 10,000.

FEAL—FEAR.

FEAL, n. *fēl* [OF. *fiel* or *feel*—from L. *fīdēlis*, faithful]: in *OE.*, faithful, as a tenant or knight to his lord.

FEAL, n. *fēl*, or **FAIL**, n. *fāl*: in *Scot.*, any grassy part; a grass-sod; turf (see **PEAT**). **FEAL-DIKE**, a wall built of sods. **FEAL AND DIVOT**, a predial servitude (q.v.) peculiar to the law of Scotland, in virtue of which the proprietor of the dominant tenement possesses the right of turning up and carrying off turf from the servient tenement for the purpose of building fences, roofing houses, and the like. The etymology of these words has been much disputed: Jamieson derives divot from *delve* (Sax. *delfan*, or *delven*), or, as alternative, says that it may have been formed by the monkish writers of old charters from *defodere*, to dig the earth: the former is more probable.

FEALTY, n. *fē'āl-tī* [OF. *feelté* and *fealte*, fidelity— from L. *fidelitatem*, fidelity— from *fīdēlis*, faithful, trusty: It. *fedele*, faithful]: loyalty; fidelity of a tenant or vassal to his superior. **F.** was anciently embodied in an oath, by which the tenant bound himself to the requisite service or dues, on entering to the lands. In taking the oath of fidelity, Littleton says, s. 91, that the tenant shall not kneel, nor shall make such humble reverence as in homage. The only object of **F.** in modern times is to keep up the evidence of tenure where no other services are due; but even to this effect it has gone into desuetude.

FEAR, n. *fēr* [AS. *fær*; Dut. *vaar*, fear. Icel. *far*; Sw. *fara*, danger: comp. Gael. *fuair*, cold, as the sensation created by great danger]: apprehension or slight dread of evil; an uneasy or painful emotion excited by impending danger; reverence; due regard; the object or cause of fear: **V.** to feel an uneasy emotion or impending danger; to be anxious; to reverence. **FEAR'ING**, imp. *h'EARED*, pp. *fēr'd*. **FEAR'FUL**, a. *-fāl*, timorous; affected with fear; inspiring fear. **FEAR'FULLY**, ad. *-lī*, in a fearful manner; in a manner to be revered. **FEAR'FULNESS**, n. **FEAR'LESS**, a. bold; courageous. **FEAR'LESSLY**, ad. *-lī*. **FEAR'LESSNESS**, n. boldness; intrepidity. **FEARSOME**, *fēr'sūm*, fearful; terrible; dreadful; awful.—**SYN.** of 'fear, n.': dread; terror; alarm; awe; dejection; anxiety; solicitude; apprehension;—of 'fear, v.': to dread; apprehend; frighten; affright; terrify; venerate;—of 'fearful': timid; afraid; awful; terrible; dreadful; frightful; apprehensive; horrible; distressing; shocking;—of 'fearless': daring; intrepid; brave; heroic; undaunted; dauntless; bold; courageous; valorous; valiant.

FEAR, MANIA OF, OR PANOPHOBIA, *păn-ō-fō'bī-a*: morbid or extreme development of the instinct of cautiousness. There are many morbid manifestations of it. Sudden fear in sleep, horrible dreams, nightmare, sleep-walking, have been regarded as symptoms of a special disease. Actual terror from irregular circulation in the sensory ganglia; the sense of falling or drowning in cardiac affections; incubus from disturbance of the circulation in the larger vessels by repletion, plethora, or position, where a delusion is added to the feeling of apprehension—all are allied, and

FEARNS—FEAST.

distinguished by involuntary and excited cautiousness. It is not only, however, when the intelligence may be supposed to be dormant, and the instincts awake, that such exaggerated fears paralyze minds otherwise sane and sound. Murat, 'the bravest of the brave,' and James I. of England, learned if not wise, were subject to vague, uncontrollable panics, which for a time unmanned them. The condition is often found as a consequence and concomitant rather than a cause of disease of the heart. The presence of the *habitual* dread of evil, the fear of death, the sleepless and breathless anxiety during darkness, or solitude, or silence, as well as the sudden, wild, ungovernable panic, point to the existence of organic or functional diseases of the heart; and conversely, excited or irregular action of the organ, murmurs, angina, lead the astute psychologist to predicate fear as a characteristic of the mental condition. It precedes, and is believed to produce chorea, cancer, and scirrhus. Proximately, however, it depends upon alterations in the capillary circulation, or nervous structure of the brain. Its characteristic is involuntary, irresistible, blind terror, which arises and continues without adequate cause, and is not influenced by reason or religion, nor even by removal of the supposed object of alarm. The disease has appeared epidemically during commercial panics, during the horrors of cholera and plague, and in that singular affection called Timoria, which is marked by debility, tremor, and terror, and has been traced to the effects of the damp, unhealthy regions in Sardinia and Sicily, where it exclusively occurs. Panophobia is hereditary, and has been traced through three successive generations. In reviewing the unobtrusive members of an asylum family, the pallid, startled, staring, flickering countenances may be detected as those of patients laboring under fear. They resemble melancholics in pallidity of skin, but in place of courting they shrink from sympathy; though horror-stricken by gloom, they hide in corners, they escape, they shriek in desperation, they climb trees, and apparently inaccessible places; and encounter real in order to elude fancied dangers; or they are motionless, paralyzed. They fear and flee from enemies, police, demons, death, punishment.—*Feuchtersleben, Principles of Medical Psychology*, p. 281; Arnold, *Observations on Nature, Kinds, Causes, and Prevention of Insanity*, etc., I. 257.

FEARNS, n. plu. *färnz* [see THERMS]: in *Scot.*, intestines; guts, as of sheep.

FEASIBLE, a. *fě'zì-bl* [*F. faisable*, easy—from *F. faire*; L. *fácĕrĕ*, to make or do]: that may be done; practicable. FEA'SIBLY, ad. *-blĭ*. FEA'SIBIL'ITY, n. *-bl'ì-tì*, the quality of being capable of execution; practicability: also FEA'SIBLENESS, n. *-bl-nĕs*.

FEAST, n. *fĕst* [*F. fĕte*; OF. *feste*—from L. *festum*, a holiday, a feast: It. *fešta*]: a plentiful entertainment to several or many guests; a banquet; something delicious to the palate; that which delights the mind; a church festival (see FESTIVALS): V. to eat sumptuously; to entertain with abundant good things; to delight. FEAST'ING, imp.: N. the act of eating luxuriously. FEAST'ED, pp. FEAST'ER,

FEAT—FEATHER.

n. one who.—**SYN.** of 'feast, n.': treat; entertainment; festivity; festival; carousal; holiday; repast.

FEAT, *n.* *fēt* [*F. fait*, an exploit—from *L. factum*, a thing done]: a daring or bold act; an extraordinary act of strength, skill, or cunning; any exploit: **ADJ.** in *OE.*, ready; skilful. **FEATER**, the compar. degree; in *OE.*, neater; nicer: **V.** in *OE.*, to set an example to; to fashion. **FEATED**, *pp.* showed an example. **FEAT'OUSLY**, *ad.* *-ūs-lī*, in *OE.*, neatly; dexterously. **FEATLY**, *ad.* *fēt'li*, in *OE.*, neatly; nimbly.—**SYN.** of 'feat': act; deed; action; trick.

FEATHER, *n.* *fēth'ēr* [*AS. fæther*; *Icel. fjödr*; *Dut. veder*, feathers; *Bav. fiedern*, to flutter]: part of the natural covering of a bird; a plume—the whole feathers of a bird are called its *plumage*; kind, nature, or class: **V.** to dress or adorn with feathers. **FEATH'ERING**, *imp.*: **N.** in *Goth. arch.*, an arrangement of small arcs or foils, separated by projecting points or cusps; a covering of feathers; in *rowing*, the turning of the blade of the oar horizontally as it leaves the water. **FEATHERED**, *pp.* *fēth'erd*: **ADJ.** clothed or covered with feathers; furnished with feathers, as an arrow. **FEATH'ERLESS**, *a.* having few or no feathers. **FEATH'ERY**, *a.* *-ēr-i*, having the appearance of feathers; light as feathers; in *bot.*, having hairs which are themselves hairy. **FEATHER-BOARDING**, or **WEATHER-BOARDING**, *n.* arrangement of boarding in which the edge of one board overlaps a small portion of that next to it. **FEATHER-EDGED**, made thin at the edges. **FEATHER-FEW**, *n.* same as **FEVER FEW**. **FEATHER-FOIL**, a wild plant; the water-violet; the *Hottoniā inflata* of the United States, and the *Hottoniā palustris* of Europe, *ord. Primulacæ*: named from Peter Hotton, Dutch botanist: it grows under water, but sends its blossoms up into the air. **FEATHER-JOINT**, *n.* a mode of joining the edges of boards by a fin or feather let into opposite mortises on the edges of the boards. **FEATHER-SPRING**, *n.* the sear-spring of a gun-lock. **FEATHER-STAR**, *Comatula rosacea*, a member of the class Echinoderms, order Crinoids. Its body is pentagonal, with 10 slender feathery arms. When young the animal is attached to a stalk; when adult it becomes free. **FEATHER-STONE**, probably corrupted from *federal stone*, a stone table in the open air at which some judicial proceedings were had, and covenants made. **FEATHER-WEIGHT**, *n.* in *racing*, lightest weight allowed to be carried by a horse in a handicap. **FEATHERING-FLOAT**, *n.* the paddle or float board of a paddle-wheel, so arranged as to turn on an axis to present its broad side to the water at its lowest submergence, but to turn its edge to the water in entering and emerging. **FEATHERING PADDLE-WHEEL**, a wheel whose floats have a motion on an axis, so as to descend nearly vertically into the water and ascend the same way, avoiding beating on the water in the descent, and lifting water in the ascent. **FEATHERING-PROPELLER**, *n.* an invention of Maudslay, London, in which the vanes of the propeller screw are adjustable, so as even to be turned into the plane of the propeller shaft and offer no resistance when the vessel is under sail and the propeller not used. **FEATHERING-SCREW**, *n.* the same as **FEATHERING-PRO-**

FEATHER—FEATHER GRASS.

PELLER. A FEATHER IN ONE'S CAP, an honor; a trophy. TO BE IN FULL FEATHER, to make a show; to be in full dress; to be up to the mark in any way. TO BE IN HIGH FEATHER, to be elated. TO SHOW THE WHITE FEATHER, to show signs of cowardice. TO TAR AND FEATHER, to smear with tar, and then cover with feathers. TO FEATHER AN OAR, to turn an oar on leaving the water, so that its blade may pass through the air horizontally, and then through the water vertically. TO FEATHER ONE'S NEST, to amass money, especially from holding an office or place; to make a snug, warm, comfortable home.

FEATHER, feth'ér: river of Cal., feeder of the Sacramento. It flows through one of the richest gold-fields in the state. It receives the Yuba near Marysville, which appears to mark the head of navigation—the distance down the F. and the Sacramento to the harbor of San Francisco being about 100 miles.

FEATHER GRASS (*Stipa*): genus of grasses remarkable for the long awns which give a peculiar and very graceful appearance to the species, mostly natives of warm temperate climate. In some the awn is beautifully feathered, as in the best known species, the COMMON F. G. (*S. pennata*), found on dry hills in the middle and south of Europe. It



Feather Grass (*Stipa pennata*).

is a perennial, easy of cultivation, and a favorite ornament of gardens. When gathered before the seeds are ripe, its feathery awns—sometimes 12 inches in length—remain attached, so that tufts of F. G. retain their beauty throughout winter. They are often dyed, to give variety to interior decoration, but are never more beautiful than in their natural yellowish-white. The feathery awns not only assist in the diffusion of the seed, which is carried by the wind to great distances, but in a very interesting manner help to fix it in the soil. The seed alights vertically, the furrowed base of the awn becomes twisted, so that its furrows form the threads of a screw, the feathery portion becomes horizontal, the wind acts on it, and

the seed is screwed into the ground, and held by barbs. American species are Black Oat Grass (*S. avenacea*) and Porcupine Grass (*S. spartea*), both w. and s.w., awns 3-7 in. long.

FEATHERS.

FEATHERS: complicated modification of the tegumentary system, forming the external covering or plumage of birds, and peculiar to this class of animals. Notwithstanding the varieties of size, strength, and color, all F. are composed of a quill or barrel, *a*; a shaft, *bb*; and a vane, beard, or web, *cc*, on either side of the shaft, the vane consisting of barbs and barbules.



Feather.

The quill by which the feather is attached to the skin is wider but shorter than the shaft, and forms a semi-transparent, horny, cylindrical tube, which terminates below in an obtuse extremity, presenting an orifice termed the lower umbilicus, *e*. A second orifice, leading into the interior of the quill, and termed the upper umbilicus, *f*, is situated at the opposite end, where the two vanes meet and unite. The cavity of the quill contains a series of conical capsules fitted one upon another, and united by a central pedicle; and the whole structure presents a remarkable combination of strength and lightness.

The shaft is always of greater length than the quill, and tapers gradually to its free extremity; it is flattened at the sides, is more or less convex on the back, and presents a longitudinal groove inferiorly. It is composed of white, elastic, spongy structure, covered by a thin horny sheath.

At the point of junction of the shaft and quill,—except on the feathers of the wings and tail—a small supplementary shaft is given off, furnished with barbs or fibres, and termed the plumule or accessory plume. In the ostrich it is altogether absent; in the rhea, it is represented by a tuft of down; in the emu it equals the original feathers in size, so that the quill supports two shafts; and in the cassowary there is a second plumule of considerable size, so that the quill presents three distinct shafts.

The vanes or webs are composed of numerous barbs or small fibres arranged in a single series along each side of the shaft. They are fine prolongations of the outer coat of the shaft, are of flattened form, and lie inclined toward the apex of the feather, with their flat sides toward each other, and their margins in the direction of the external and internal sides of the feather. The barbs are broader near the shaft than at the free apex, and in the large wing-feathers the convexity of one is received into the concavity of another. They are, however, generally kept in position by the barbules, which are minute curved filaments arising from the upper edge of the barb, much as the latter arises from the shaft. There are two sets of these barbules, one curved upward, and the other downward, and those of one barb hook so firmly into those of the next, as to form a close and compact surface. In the ostrich, the barbules

FEATHERS.

are well developed, but are loose and separate, and it is this arrangement which gives to the feathers of this bird their soft, plumous appearance.

F. present numerous gradations of structure. In the cassowary, the wings, instead of being provided with ordinary F., are furnished with five cylindrical stalks destitute of barbs, so that there are merely the quill and shaft. On the breast of the wild turkey is a tuft of F. resembling long black hair. In the *Dasylophus Cumingii*, the F. of the crest, breast, and throat are changed, at their extremities, into round, horny lamellæ, looking like shining black spangles; and in the common waxwing or Bohemian chattering, some of the wing-feathers present at their extremities small horny expansions, resembling red sealing-wax, both in color and consistence.

Besides the common F., the skin of many birds, especially of aquatic species—in which plumules rarely exist—is covered with a thick coating of down, which may be described as consisting of very minute F., each composed of a very small soft tube lying in the skin, from the interior of which arises a minute tuft of soft filaments, without any central shaft. This downy covering secures warmth without weight, like the soft fur at the base of the hair of arctic mammals. In most birds, the skin also bears a good many scattered hair-like appendages, which indicate their relations to the ordinary F. by the presence of a few minute barbs toward the apex.

F. are developed in depressions of the skin, lined by an inversion of the epidermis which surrounds the bulb from which each feather springs; they grow, much in the same manner as hairs, by the addition of new cells from the bulb, which becomes modified into the horny and fibrous stem, and by the elongation of previously existing cells. They are, when first formed, living vascular parts, growing by nutrient vessels; but when they are fully formed, the vessels become atrophied, and the F. become dried up, and gradually die from the summit to the base. For a full account of the development of the different parts, see Prof. Owen's article, 'Aves,' and Prof. Huxley's article, 'Tegumentary Appendages,' in the *Cyclopædia of Anatomy and Physiology*.

F. grow with great rapidity, and in some birds attain a length of more than two ft. They are almost always renewed annually, and in many species oftener; hence it may be conceived how much vital energy must be exhibited in their development, and how critical the period of moulting must be. The plumage is generally changed several times before it attains the state which is regarded as characteristic of the adult bird; these changes may occupy a period usually ranging from one to five years.

Notwithstanding their extravascular nature, F., as is well known, undergo a change of color after they are completely formed. In yearling birds, the winter plumage, which succeeds the autumnal moult, gradually assumes brighter tints, the new color commencing at the part of the vane nearest the body, and gradually extending out-

FEATHERS.

ward till it pervades the whole feather. Dr. Weinland, an American naturalist, is of opinion, from a comparison of bleached specimens in museums, with recent ones taken from the bird, that the brightness and fading of the colors are due to the increase or diminution of an oily matter. Thus, the microscopic examination of the vane of F. from the breast of a fresh merganser showed numerous *lacuna* containing a reddish oil-like fluid; some weeks later, the same F. having become nearly white from exposure to light, disclosed air-bubbles instead of the reddish fluid. If this fluid is an actual oil, as is probably the case, it could make its way into the non-vascular tissue by mere physical imbibition; and on the varying quantities of this oil the variations of plumage would depend.

The property possessed by the plumage of most birds, of keeping the surface protected from moisture, is well known. This is due to two causes. Most birds are provided with an oil-gland at the base of the tail, whose secretion is distributed over the F. by means of the bill; and, additionally, the shedding of water is partly due to a thin plate of air entangled by the feathers.

The F. vary in form in different parts of the body, and afford zoological characters for distinction of species. Hence, they have received distinct names, such as primaries, secondaries, tertiaries, etc., in ornithology: see BIRDS.

The chief uses to which F. are applied in the arts are three—*pens*, because of the peculiar elasticity of the barrels; *bed-feathers*, because of the combined softness and elasticity of the barbs; and *ornament*, because of the graceful forms and delicate tints of the whole feather. For the mode of preparing the barrels for pens, see QUILLS.

Bed-feathers were used in England in the time of Henry VII.; but it is not known how much earlier. At present, goose-F. are preferred, the white rather than the gray. What are called *poultry* F., such as those of the turkey, duck, and fowl, are less esteemed, on account of their deficient elasticity. Wild-duck F. are soft and elastic, but contain an oil difficult to remove. The following is one among several modes of preparing F. for beds. Clean water is saturated with quicklime; the F. are put into a tub; the lime-water is added to the depth of a few inches; the F. are well steeped and stirred for three or four days; they are taken out, drained, washed in clean water, dried upon nets, shaken occasionally while drying, and finally beaten to expel any dust. The larger establishments, however, now prepare bed-feathers by steaming, which is found more profitable and efficient. The *down*, which is of so light and exquisite a texture as to have become the symbol of softness, is mostly from the breasts of birds, and forms a warm and delicate stuffing for beds, pillows, and coverlets. The most valuable is that from the eider-duck: see EIDER.

F. used for head-dresses, or other purposes of ornament, are selected for their forms and colors. The *ostrich*, a very valuable kind of feather, is an example of the way in which ornamental F. generally are prepared by the *plu-*

FEATURE—FEAZE.

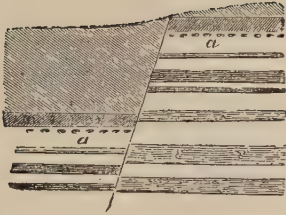
massier. The hunters endeavor to avoid injuring the F. by blood or blows: see OSTRICH. The F. are assorted according to quality; those from the back and above the wings are best, the wing-F. next best, and the tail-F. least valued. The F. of the male are rather more prized than those of the female. They are cleaned for use by repeated soakings and washings in water, sometimes with and sometimes without soap. There is also a process of bleaching by means of burning sulphur. When dried by being hung upon cords, the F. pass into the hands of the dresser, who opens the fibres by shaking, gives pliancy to the ribs by scraping them with bits of glass, and curls the filaments by passing the edge of a blunt knife over them. If the F., whether of the ostrich or any other bird, remain in the natural color, little more has to be done; but if a change of tint be required, the F. easily take dye-materials—such as safflower and lemon-juice for rose-color or pink, Brazil-wood for deep red, Brazil-wood and cudbear for crimson, indigo for blue, turmeric or weld for yellow, etc. A process of bleaching is adopted before the dyeing, except for black.

The kinds of F. chiefly used for ornament are those of the ostrich, adjutant, rhea or American ostrich, emu, osprey, egret, heron, antrenga, bird of paradise, swan, turkey, peacock, argus pheasant, ibis, eagle, and grebe. White ostrich F. are prepared chiefly for ladies' head-dresses; and black for some military and some funereal trappings. The white and gray marabout-stork F., imported from Calcutta, are beautifully soft and light, and are in request for head-dresses, muffs, and boas; the white kinds will sometimes sell for their weight in gold. The flossy kinds of rhea feather are used for military plumes, and the long brown wing F. for brooms and brushes. Osprey and egret F. are used mostly for military plumes by Hussar troopers. Bird of Paradise F. are much sought by oriental princes for turban-plumes. Cocks' F. are used for ladies' riding hats and for military plumes. Dr. Macgowan, U. S. consul at Ningpo a few years ago, described, in the *American Journal of Science and Art*, an ingenious process which the Chinese adopt for combining brilliant-colored F. with bits of colored metal into garlands, chaplets, frontals, tiaras, and other ornamental articles.

FEATURE, n. *fē'tūr* or *-chūr* [It. *fattura*; OF. *faiture*, the making or workmanship of a thing—from L. *factura*, a making: Norm. F. *faitura*, fashion, make—connected with *feat*—*lit.*, the make or workmanship of a thing]: the make, form, or cast of any part of the face; any single lineament; outline; prominent parts; outward appearance. FEA'TURED, a. *-tūrd*, having features. FEA'TURELESS, a. without features.

FEAZE, v. *fēz* [AS. *fæs*, a fringe; Ger. *fäsen*, to ravel out]: to untwist the end of a rope; to unravel.

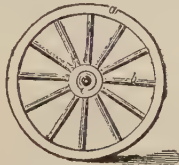
FEAZE, FEIZE, FEEZE, or PHEESE, v. *fēz* [Swiss, *fitzen*; Dut. *veselen*; F. *fesser*, to whip, to switch; Swiss, *fitzer*, rods for children]: in OE., to whip; to chastise; to beat; to drive away. FEAZ'ING, imp. FEAZED, pp. *fēzd*.



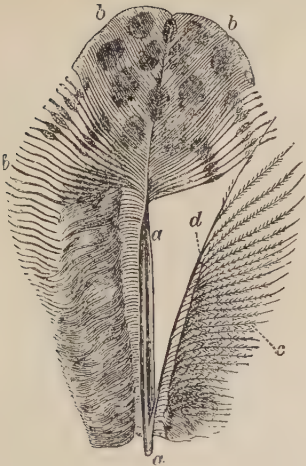
Fault: *a, a*, Show change of position in strata occasioned by a fault.



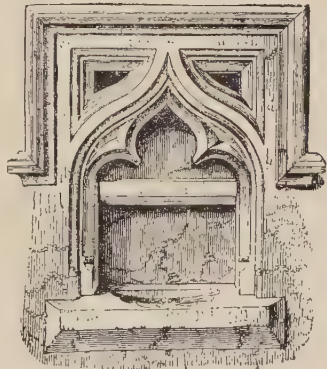
Dancing Faun.—Antique Statue, Florentine Museum.



Wheel: *a*, Felly; *b*, Spokes; *c*, Nave.



Feather from the back of *Argus giganteus*: *a*, Shaft (rachis); *b*, Barbs forming the vexillum, removed from one side of both shaft and undershaft; *c*, Baricules on the barbs; *d*, After-shaft.



Fenestella with Piscina.

FEBIGER—FEBRUUS.

FEBIGER, *fěb'î-gér*, CHRISTIAN: 1746-1796, Sep. 20; b. island of Fünen, Denmark: soldier. He received a military education, served on the staff of his uncle when gov. of Santa Cruz, travelled through the American colonies 1772, engaged in commercial business in New England, was adjutant of a Mass. regt. at Bunker Hill, was taken prisoner while serving under Arnold in the Quebec campaign, 1775, Dec. 31; became lieut.col. of a Va. regt. 1776, Nov., took part in the Penn. campaign, and was promoted col. for gallantry at Brandywine. At Germantown he commanded the right of Greene's wing, at Monmouth led a force of 4,000 men and two guns, and at Stony Point commanded the right column and personally captured the British commander. He retired from active service after Cornwallis's surrender, was brevetted brig gen. 1783, Sep. 30, and was treas. of Penn. from 1789, Nov. 13, till death.

FEBRILE, a. *fěb'rîl* or *fěb'* [F. *fěbrîle*, pert. to a fever—from L. *fěbrîlis*—from *fěbris*, a fever]: pertaining to a fever; indicating fever; feverish. **FEBRICULA**, n. *fěb-rîk'-û-lû* [L.]: a slight fever, called sometimes Ephemera (fever of a day): see FEVER.—**FEB'RIFUGE**, n. *-rî-fûj* [L. *fěbris; fûgô*, I drive away]: any medicine that mitigates or removes a fever (q.v.). **FEBRIS**, n. *fě'brîs* [L.]: fever.

FEBRONIANISM, *fě-brô'nî-an-îzm*: in Rom. Cath. theology, a system of doctrine antagonistic to the admitted claims of the Roman pontiff, and asserting the independence of national churches, and the diocesan rights of individual bishops in matters of local discipline and church government. The name is derived from the *nom de guerre*, Justinus 'Febronius,' assumed by John Nicholas von Hontheim, coadjutor archbishop of Treves, in a work on these subjects, entitled *De Præsenti Statu Ecclesiae*, which he published 1767, and which, with its several successive volumes, led to a violent and protracted controversy, and elicited the severest censures of the Roman tribunals. See HONTHEIM: GALLICAN CHURCH.

FEBRUARY, n. *fěb'rô-ér-î* [L. *Fěbrûārîûs*, the month of expiation—from *fěbrûûm*, an expiation]: second month of the year; having ordinarily 28 days, but in leap-year having an additional or intercalary day. Among the Romans, it had originally 29 days in an ordinary year, but when the senate decreed that the eighth month should bear the name of Augustus, a day was taken from February, and given to August, which had then only 30, that it might not be inferior to July. The name is derived from the fact that during this month occurred the Roman festival called the Lupercalia, and also Februalia, from *fěbruare*, to purify.

FEBRUUS, *fěb'rû-ûs* [connected with Lat. *fěbruare*, to purify]: ancient Italian divinity, whose worship was celebrated with lustrations during the month of February. The ceremonies instituted in his honor were believed to have the effect of producing fertility in man and beast. F., whose name in the Etruscan language is said to have signified god of the lower world, was also worshipped as such by the Romans, and identified with the Greek Pluto.

FECAMP—FECULA.

FECAMP, *fā-kǒng'*: manufacturing town and seaport of France, dept. of Seine Inférieure, in a narrow valley, flanked on either side by steep cliffs, at the mouth of a stream named F., same name on the English Channel, 23 m. n. e. of Havre. It consists mainly of one long street. Its principal building is the handsome church of Notre Dame, in the early pointed style, dating from the 14th c. The harbor is frequented by colliers from Newcastle and Sunderland, and by Baltic timber-ships and fishing-vessels. F. has cotton-mills, sugar-refineries, tanneries, ship-building yards, and some linen-cloth and hardware manufactures. Pop. 12,000.

FECES, **FECAL**, etc.: see **FÆCES**.

FECHTER, *fěsh'tēr*, **CHARLES ALBERT**: actor of eminence: abt. 1823–1879, Aug.; b. London; son of a Frenchman. When only three or four years old, he went with his parents to France, and was educated as a sculptor; but his predilections were for the stage; and he soon became a popular actor. In 1860 he was announced to appear in an English version of *Ruy Blas* at the Princess's, London, and so perfectly identified himself with the character, that people almost forgot his French accent, in admiring the energy and finish of his acting. In the following year, Mar. 20, he appeared in the character of Hamlet. While abandoning the traditions of the English stage, F. showed himself capable of appreciating the difficulties that he had to contend with, and in some measure of surmounting them. The impersonation was, on the whole, one that marked him as an actor of very high powers. The same may be said of his representation of Othello. Subsequently F. became lessee of the Lyceum Theatre, playing the chief part in most of the pieces produced. In 1870 he made a successful visit to the United States, where he thenceforward remained, and where he died.

FECIAL, a. *fě-shal* [L. *fētiālis*, a public officer employed in the declaration of war]: of or pertaining to the *Feciales*: N. in *Rom. antiq.*, one of a college of 20 priests, said to have been instituted by Numa, who presided over all the ceremonies connected with the ratification of peace or the formal declaration of war.

FECIT, v. *fě'sit* [L. he did it or made it]: a word inscribed on the work of a painter or sculptor after his name to indicate that 'he did it' or 'he made it.'

FECKLESS, a. *fěk'lēs* [Scot. *feck*, worth, power, value]: in *Scot.* and *OE.*, powerless; of no account; worthless.

FECULA, or **FÆCULA**, n. *fěk'ū-lū* [L. *facūlā*, salt of tartar deposited from wine—from *fix*, dregs or sediment: F. *fēcule*]: starchy powder obtained in great abundance from plants and their seeds, etc., by crushing and washing them, and allowing the matter to settle; starch—in France usually potato-starch (see **STARCH**): farina—also called *amylum*. **FECULENT**, a. *-lěnt* [F.—L.]: foul; muddy; abounding with sediment. **FECULENCE**, n. *-lěns*, or **FECULENCY**, n. *-lěn-si*, the state or quality of being feculent; muddiness; sediment.

FECUND—FECUNDATION.

FECUND, a. *fěk'ünd* [L. *fēcūndūs*, apt to bear young, fruitful: It. *fecundo*: F. *fěcond*]: fruitful; prolific. **FECUNDATE**, v. *-ün-dăt*, to make fruitful. **FECUNDATING**, imp. **FECUNDATED**, pp. **FECUNDATION**, n. *-dă'shŭn*, the act of making fruitful or prolific; impregnation. **FECUNDITY**, n. *fě-kŭn'di-ti* [OF. *fecundité*—from L. *fēcunditatem*, fruitfulness]: fruitfulness; the power of producing or bringing forth.

FECUNDATION, or **FERTILIZATION**, in Plants: reproductive process according to laws similar to those which prevail in the animal kingdom. In plants, however, the organs of reproduction are not permanent as in animals, but fall off—the male organs generally soon after fecundation, the female after the ripening of the seed. The male seminal substance, called *pollen*, never exists in a fluid state, but always in that of granules of various forms (*pollen grains*), which consist each of one cell, whose covering is of various thickness, and contains the impregnating substance. After the dehiscence of the anthers, the pollen comes into contact with the stigma of the pistil, which in its lowest and thickest part (the *ovary* or *germen*) contains the rudiments of the future seeds (*ovules*). The inner layer of the cell-covering of the pollen grain separates from the outer and thicker layer, as if it came out of a bag, and continuing to be elongated by growth, is carried down through the *style* to the germen, where it reaches the *foramen* or small opening of the embryo sac, and comes into contact with the ovule, or even in many cases penetrates into the ovule itself between its cells. By this time, one or other of the cells of the ovule has become considerable more enlarged than the other cells, and what is called the *annion* has been formed, in the mucilaginous fluid of which (*protoplasma*), after the contact of the pollen bag, through the dynamic operation of its contents, a *cell-germ* or *cytoblast* is soon developed. This cytoblast is the first commencement of a new and distinct cell, which divides into two cells. These increase, by continually repeated separation of new cells, into a cellular body, which forms the more or less perfect *embryo* of a new plant. If the organ from which the pollen has proceeded, and the organ which contained the ovule, belong to the same plant or to plants of the same species, the embryo arising from this fecundation becomes a plant of the same species. But if the pollen by which the fecundation is effected comes from a plant of another species than that to which the plant belongs in whose germen the embryo is formed, the seed resulting from this fecundation will not, when it grows, produce plants of the same species, but *hybrids*, intermediate between the parent plants, and with various degrees of resemblance to one or other of them, but not perfectly corresponding with either. Hence the production of hybrids, and multiplication of varieties of plants in gardens, by what is called the artificial impregnation of the stigma of one plant with the pollen of another, which, however, must be of an allied species, hybridization being confined by the laws of nature within very narrow limits.

FED—FEDERAL GOVERNMENT.

See REPRODUCTION: PLANT: STAMEN: PISTIL: VEGETABLE PHYSIOLOGY.

FED, v. *fěd*: pt. and pp. of FEED, which see.

FEDERAL, a. *fěd'ěr-ŭl* [F. *fédéral*—from L. *fœdērālīs*—from L. *fœdus*, a league or treaty]: pertaining to a league; consisting in a compact or agreement between nations, or between the several states of a nation, as in Switzerland or America: N. in *Amer.*, an advocate of the strengthening of the central government. FEDERACY, n. a confederation or union of several states under one central authority, consisting of delegates from each state, in matters of general polity, but self-governing in local matters. FEDERALISM, n. *-izm*, the principles of the federals. FEDERALIST, n. a supporter of federalism; a federal. FEDERALIZE, v. *-iz*, to league together. FEDERALIZING, imp. FEDERALIZED, pp. *-izd*. FEDERATE, a. *-ăt*, united by compact. FEDERATION, n. *-ă'shŭn* [F.—L.]: the act of uniting in a league; a league; a union for purposes of government. FEDERATIVE, a. *-ăt-iv*, joining in a league or contract; forming a confederacy.

FEDERAL GOVERNMENT: central or national government administered by a union of states according to a compact binding all the states. When several states, otherwise independent, bind themselves together by a treaty, so as to present to the external world the aspect of a single state, without renouncing their individual powers of strictly internal self-government, they are said to form a Federation or Federal Union. The contracting parties are sovereign states acting through their representatives; and the extent to which the central overrules the local legislatures is fixed by the terms of the contract. In such degree or extent as the sovereignty of the several states is reduced, and the central power becomes sovereign within the limits of the federated states, the federation approaches to the character of a Union. The only renunciation of sovereignty which a federation as such necessarily implies, consists in abandoning the power which each separate state otherwise would possess of forming or conducting independent relations with foreign states. 'There are,' says Mr. Mill, 'two different modes of organizing a federal union. The federal authorities may represent the government solely, and their acts may be obligatory only on the governments as such, or they may have the power of enacting laws and issuing orders which are binding directly on individual citizens. The former is the plan of the German so-called confederation, and of the Swiss constitution previous to 1847. It was tried in America for a few years immediately following the war of independence. The other principle is that of the existing constitution of the United States, and was adopted by Switzerland at the revision of the constitution 1874. The federal congress of the American Union is a substantive part of the government of every individual state. Within the limits of its attributions, it makes laws which are obeyed by every citizen individually, executes them through its own

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officers, and enforces them by its own tribunals. This is the only principle which has been found, or which is ever likely to produce an effective federal government. A union between the governments only is a mere alliance, and subject to all the contingencies which render alliances precarious.'—*Representative Government*, pp. 301, 302. See CONFEDERATION. CONFEDERATION OF THE THIRTEEN AMERICAN COLONIES. One of the chief difficulties which arise in organizing a federal government, consists in discovering by what means disagreements between one or more of the local governments and the central government as to the limits of their respective powers, are to be disposed of. The arrangement by which this object was sought to be effected in America, of which M. de Tocqueville expressed his admiration, is thus explained by Mr. Mill: 'Under the more perfect mode of federation, where every citizen of each particular state owes obedience to two governments—that of his own state, and that of the federation—it is evidently necessary not only that the constitutional limits of the authority of each should be precisely and clearly defined, but that the power to decide between them in any case of dispute should not reside in either of the governments, or in any functionary subject to it, but in an umpire independent of both. There must be a supreme court of justice, and a system of subordinate courts in every state of the union, before whom such questions shall be carried, and whose judgment on them, in the last stage of appeal, shall be final. Every state of the union, and the federal government itself, as well as every functionary of each, must be liable to be sued in those courts for exceeding their powers, or for non-performance of their federal duties, and must in general be obliged to employ those courts as the instrument for enforcing their federal rights. This involves the remarkable consequence, actually realized in the United States, that a court of justice, the highest federal tribunal, is supreme over the various governments, both state and federal, having the right to declare that any new law made, or act done by them, exceeds the powers assigned to them by the federal constitution and, in consequence, has no legal validity.'—(P. 305.) 'The tribunals which act as umpires between the federal and state governments naturally also decide all disputes between two states, or between a citizen of one state and the government of another. The usual remedies between nations, war and diplomacy, being precluded by the federal union, it is necessary that a judicial remedy should supply their place. The supreme court of the federation dispenses international law, and is the first great example of what is now one of the most prominent wants of civilized society, a real international tribunal.' Mr. Mill's confidence in this remarkable tribunal, in which, de Tocqueville shared, has been historically justified. The wild attempt at secession, involving the great rebellion of 1861, was due to no defect in the organic bond, which, as the result proved, was so strong as to be unbreakable; but was due to an exceptional and excited element of discord

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—slavery—which was cut out by the sword, leaving the federal government stronger than before.

FEDERALIST, *féd'ér-al-íst*, **THE**: collection of 86 essays written anonymously over a common signature, *Publius*, by Alexander Hamilton, James Madison, and John Jay, and addressed to the 'People of the State of New York.' The purpose of the essays was to secure the adhesion of N. Y. to the federal constitution proposed by the convention of 1787, Sep. 17, and excepting the last 9 all were published in *The Independent Journal*, semi-weekly newspaper of New York, 1787, Oct. 27—1788, Apr. 2. The essays were first published in book form, 2 vols. 12mo, 1788, and have been republished many times. A peculiar historical value is attached to the collection, as they are held to present most fully the views of the framers of the constitution on the necessities of the day and the requirements of the government in the future. Much curious speculation has been indulged concerning the authorship of the several essays.

FEDERALISTS: see **POLITICAL PARTIES**.

FEDERAL THEOLOGY: system resulting from endeavors to compress Christian doctrine within the limits of certain covenants conceived of as made between God and man, and between the Father and the Son in the Eternal Godhead: see **COVENANT**, in theology.

FEE, n. *fē* [*AS. feoh*; *Icel. fe*, cattle, money: *Dut. vee*, cattle: *Goth. faihu*, cattle. property—connected with *fief* and *feudal*]: price paid for service—generally said of professional men; reward or recompense; any land or tenement held of a superior on certain conditions: **V.** to pay a fee to; to engage in one's service; to hire. **FEE'ING**, *imp.* retaining by a fee; in *Scot.*, hiring for service. **FEED**, pp. *fēd*, retained by a fee, as a lawyer. **FEER**, n. *fē'ér*, one who holds a fee, or in fee, as an estate or property. **RETAINING-FEE**, the fee paid to a lawyer to secure his services. **FEE-FARM**, land held by the payment of rent. **FEE-SIMPLE**, an estate in lands or tenements of which the owner has the fullest power of disposing which the law allows (see **FEE**, **ESTATE IN**). **FEE-TAIL**, a limited inheritance; an estate handed down by entail (q.v.). **FEE AND LIFE'RENT**, in the *law of Scotland*, the first the full right of proprietorship, the second the limited right of usufruct during life. These may be held together, or may coexist in different persons at the same time. **FEE-FUND**, in *Scotland*, fund arising from the payment of dues of court on the tabling of summonses, the extracting of decrees, and the like, applied to payment of the clerks and other inferior officers of the court. This duty, since the act of 1868, is collected by stamps.

FEE, ESTATE IN: largest estate in land in point of quantity of estate known to the law of England, being a freehold (q.v.) of inheritance. Estates in fee are divided into fee-simple and fee-tail. A fee-simple is defined by Littleton (l. a.) to be a lawful and pure inheritance. In order to create an estate in fee-simple by deed, it is necessary that the word heirs should be used; for a gift by deed

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to a man for ever, or to a man and his assigns for ever, creates only an estate for life. But words of perpetuity annexed to a gift to a man by will are construed as carrying an estate in fee. The proprietor of an estate in fee-simple enjoys the fullest rights of property over his estate, which he may alienate or burden at pleasure, and out of which he may grant estates of a lower kind, as for life or years. He is owner of the soil '*a cælo usque ad centrum*,' and is therefore entitled to every product of the land, as timber, etc., and to all minerals and other valuable productions found beneath the surface. On his death, the estate descends to his right heirs, except in the case of fees held by corporations, which descend to their successors in office. Where a man claims an estate in fee-simple in possession in a corporeal hereditament (q.v.), he is said to be 'seized in his demesne as of fee.' Estates in fee-simple are divided into fee-simple absolute, qualified or base, and conditional. A qualified or base fee differs from a fee-simple absolute by having a qualification annexed which may determine the estate, as where it is granted to a man and his heirs 'tenants of the manor of Dale.' If, therefore, at any time the holder of the estate ceases to be the tenant of Dale, the estate, which depended on that qualification, determines.

A *conditional fee* was limited to a particular class of heirs, to the exclusion of others, as to a man and the heirs-male of his body. On failure of heirs-male of the body of the grantee, an estate of this kind reverted to the grantor or his heirs. In interpreting this law confusion arose, and by the famous statute *De Donis Conditionalibus* (13 Ed. I. c. 1), it was enacted that estates should be held *secundum formam doni*. Estates created by this statute were called estates in *fee-tail*. See ENTAIL.

The original mode of transferring an estate in fee was by feoffment (q.v.), but the statute of Frauds (29 Char. II. c. 3) requiring that writing should be used in all transfers of land, estates in fee must now be conveyed by deed or will.

The proprietor of an estate in fee-simple in the present day is substantially absolute owner of the freehold, which he holds without owing duty or service to any one, except the allegiance due to the sovereign, or civil power. But originally this was not so; an estate in fee is in its nature a feudal benefice, a feud, and the owner of the fee held his estate subject to all the services incident to the feudal state. But these duties, which never existed in the United States, have been by degrees entirely abolished in England: see FEUDAL SYSTEM: TENURES. In Scotland, the feudal usages in regard to land are still retained to a very great extent. See Paterson's *Compendium of English and Scotch Law*. An estate in fee in Scotland must be held by one of the three existing tenures—viz., feu, blanch, or burgage, and is subject to the casualties (q.v.) attaching to these rights.

FEEBLE. a. *fēbl* [OF. *fleble* and *foible*; F. *faible*, weak. It. *fievole*, feeble—from mid. L. *flebilis*, infirm]; deficient in energy; weak; infirm; faint; imperfect; slender. V. in

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OE., to enfeeble; to make weak. **FEEBLED**, pp. *fēbld*, made weak. **FEEBLY**, ad. *-bli*, in a feeble manner; weakly. **FEEBLENESS**, n. *-bl-nēs*, want of strength. **FEEBLE-MINDED**, weak of mind; wanting in resolution.

FEED, n. *fēd* [*AS. fedan*, to feed, to bring up: *Sw. fäda*; *Dan. föde*, to feed, to give birth to: comp. *Gael. fiadh*, meat, food (see **FOOD**)]: a certain quantity of food eaten at one time; a certain allowance of food given at one time, as to a horse or cow: *V.* to supply with food; to furnish with a supply of anything constantly required; to nourish; to keep: in hope; to take food; to pasture or graze. **FEEDING**, imp. *N.* act of eating or giving food to; pasture. **FED**, pt. and pp. *fēd*, furnished with food; nourished. **FEED-CLOTH**, n. in *fibre*, the apron which leads the cotton, wool, or other fibre into the cleaning, lapping, carding, spinning, or other machine. **FEED-CUTTER**, a machine for cutting straw, hay, or cornstalks into short feed or chaff. **FEED-HAND**, n. in *gear.*, a rod by which intermittent rotation is imparted to a ratchet-wheel. **FEED-HEAD**, in *steam-eng.*, a cistern containing water and communicating with the boiler of a steam-engine by a pipe, to supply the water by the gravity of the water, the height being made sufficient to overcome the pressure within the boiler. **FEED-HEATER**, in *steam*, a drum or chamber in which feed-water for the boiler is heated by the exhaust steam. **FEED-MOTION**, contrivance in a machine by which the material under treatment is advanced or fed to the machine. **FEED-PIPE**, a pipe leading from the water-source to the bottom of a boiler, generally of a steam-engine. **FEED-PUMP**, a force-pump driven by hand, or by donkey-engine, or by the engine itself, for supplying to the boiler a quantity of water equal to that removed in the form of steam. **FEED-SCREW**, in *turn.*, a long screw employed to impart a regular motion to a tool-rest or to the work; as the feed-screw in the bed of a lathe, which moves the screw-cutting tool. **FEED-WHEEL**, a continuously or intermittently revolving wheel or disk which carries forward an object or material. **FEED OF A LOCK**, in *hydraul. eng.*, the amount of water required to pass a boat through a canal lock. **FEED'ER**, n. he or that which feeds or supplies, in *OE.*, promoter or encourager; one who eats.—*SYN.* of 'feed, v.' to cherish; foster; nurture, supply; satisfy; graze; prey; pasture.

FEEJEE: see **Fiji**.

FEEL, v. *fēl* [*AS. felan*; *Ger. fühlen*; *Dut. voelen*, to feel: *Icel. fialla*, to touch softly with the palm of the hand]. to perceive or search after by the touch; to experience; to try; to suffer or enjoy; to be affected by; to have the sensibility excited, to have the passions moved: *N.* sense of feeling; touch. **FEEL'ING**, imp. *ADJ.* expressive of great sensibility; easily affected or moved: *N.* sense of touch perception; emotion; tenderness or sensibility of mind (see **EMOTION**). **FELT**, pt. and pp. *fēlt*, perceived; be affected by. **FEEL'ER**, n. he or that which feels. **FEEL'ERS**, n. plu. *-ērz*, any long sensitive organs, like the antennæ of insects or the whiskers of a cat. **FEEL'INGS**, n. plu. nice sensibili-

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ities. **FEEL'INGLY**, ad. *-lī*, tenderly; in a manner to be sensibly felt. **TO FEEL AFTER**, to search for; to seek for in order to find.—**SYN.** of 'feeling': sensation; susceptibility; sense; passion; consciousness; sentiment; opinion; agitation.

FEER: see under **FEE**.

FEER, or **FIER**, v. *fēr* [AS. *fyrian*, to make a furrow]: in *Scot.*, to mark out the breadth of ridges with the plow. **FEER'ING**, imp. and n. **FEERED**, pp. *fērd*.

FEER, or **FERE**, n. *fēr* [AS. *gefera*, a companion: Gael *fear*, a man, a husband: L. *vir*, a man]: in *OE.*, one who *fares*, or goes with another; in *Scot.* and *OE.*, a companion; a wife; a lover. **IN FEER**, together; in company.

FEES, of Lawyers and Physicians. In England, neither barristers nor physicians could recover their fees by legal proceedings against their clients or patients, except under a special contract. The ground of this rule was that such fees are regarded not as payment, but as an expression of gratitude for services the value of which cannot be appreciated in money, and for which a certain sum cannot be demanded without wrong to the claimant's reputation. The origin of the rule in the case of advocates (in regard to whom it is still in force), is traced to the relation between patrons and their clients in ancient Rome. When the former appeared as the defenders of the latter, they practiced, as Blackstone says (iii. 29, Kerr's ed.), *gratis*, for honor merely, or at the most for the sake of gaining influence. The rule at Rome was maintained even under the emperors; and Tacitus mentions (*Ann.* lib. ii. c. 5) that it was directed by a decree of the senate that these *honoraria* should not in any case exceed 10,000 sesterces, or about £80 of English money. It has further been decided in England, that no action lies to recover back a fee given to a barrister to argue a cause which he did not attend (Peake, 122). But special pleaders, equity draftsmen, and conveyancers, who have taken out certificates to practice under the bar, and therefore are not counsel, may recover their reasonable charges for business done by them (*Poucher v. Norman*, 3 B and C., 744). Another rule with reference to the fees of barristers and advocates is, that they are paid before they are earned; thus removing from legal practitioners all pecuniary interest in the issue of suits.—As regards physicians, the rule that a fee could not be recovered by an action at law, was applied in the case of *Chorley v. Bolcot*, 1791, June 30 (4 T. R. 317). If, however, either a barrister or a physician acted under a special agreement or promise of a certain payment, then an action might be brought for the money. But all medical practitioners were relieved from the above code of honor by the act of 21 and 22 Vict. 90, which applied to the United Kingdom, and enabled them to recover in any court of law their reasonable charges as well as costs of medicines and medical appliances used. This rule applies to physicians, surgeons, and apothecaries as defined by the statute. Members of the inferior branches of both professions—attorneys, solicitors, etc., on the one hand, and sur-

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goons, dentists, cuppers, and the like on the other—were always entitled to raise action for their fees. In Scotland, the same rules prevail as in England with reference to both professions. In France, though the delicate sense of honor of the bar has always been preserved with quite as much care as in England, the rule is somewhat different. In law, an action for the recovery of fees would be maintainable in that country by an advocate; but 'in Paris, the rule of the ancient bar, founded on the disinterestedness which was its characteristic, and according to which any judicial demand of payment of fees was strictly forbidden under pain of erasure from the table (of advocates), has been religiously preserved.'—*History of the French Bar*, by Robert Jones, 1855. The practice in France seems to be for the fees of advocates to be paid afterward, though any bargain with the client or his agent that their amount shall depend on the issue of a trial, is regarded as dishonorable; and on several occasions the bar has vehemently resisted regulations, calling on them to acknowledge receipt of their fees, as wounding their sensibility.

In the United States, all practitioners of the healing art, who have duly complied with the laws in respect to license, registration, etc., whether physicians, surgeons or apothecaries, can sue for their fees. The view that a physician's services are purely honorary does not, and never did prevail. In the absence of a specific agreement as to the amount of compensation, the physician will be entitled to what is termed a 'reasonable' fee. This means such just, and fair pay as is charged for similar services by other physicians of like standing and capacity. If prior dealings have taken place between the parties and no new agreement is made in respect to fees, the former rate is presumed to continue.

In respect to lawyers, the English distinctions between barristers and attorneys do not exist. All members of the profession stand upon the same legal footing. Neither law nor custom forbids an American lawyer from suing for his charges. As in the case of physicians, such charges, where no agreement has been made regulating them, must be reasonable and proportioned to services actually rendered.

FEET, n.: plu. of FOOT, which see.

FEFT, v. *fěft*, for INFECT [see ENFEOFF]: in *Scot.* and *OE.*, for *enfeoffed*; to put in possession of a property with the legal formalities.

FEHÉRVÁR (SZÉKES)—the Latin *Alba Regia*, German *Stuhlweissenburg*: one of the most ancient royal free towns of Hungary; in a marshy district about 40 m. s.w. of Pesth. Under the Arpadian kings, it was the metropolis of the realm, and the residence of the sovereigns, many of whom have been crowned and buried there. On many occasions, the diets also were held in F., where 12 kings—among which are St. Stephen, and the great Mathias Corvinus—lie buried. It is the seat of a bishop, and its people are chiefly Rom. Catholics, and all of the Magyar race. Water is supplied by an artesian well. Pop. (1880) 25,612.

FEHMIC COURTS—FEITH.

FEHMIC COURTS, or **FEHMGERICHTE**: see **FEMGERICHTE**.

FEIA, *fā-ē'a*: large lake of Brazil, on the maritime border of the province of Rio Janeiro, 150 m. n.e., from the city of Rio Janeiro. It is so near to the Atlantic that it has been connected with it by a canal. F. is about a degree n. of the southern tropic.

FEIGN, *v. fān* [*F. feindre*; *OF. feigner*, to dissemble—from *L. fingere*, to form, to contrive—*lit.*, to form, contrive, or invent]: to make a show of doing; to assume or pretend; in *OE.*, to relate falsely. **FEIGN'ING**, *imp.* inventing; pretending: *N.* a false appearance; an artful contrivance. **FEIGNED**, *pp. fānd*. **FEIGN'ER**, one who. **FEIGN'EDLY**, *ad. -ēd-lī*, in pretense; not really. **FEINT**, *n. fānt* [*F. feinte*, a pretense]: a pretense; a false appearance; a mock attack; the appearance of aiming at or offering when something quite different is intended. **FEIGNED-ISSUE**, *n.* in *law*, proceeding in law whereby an action is supposed to be brought by consent of the parties, to determine some disputed right, without the formality or expense of pleading (see **FENCING**).—**SYN.** of 'feign': to simulate; dissimulate; imagine; contrive; represent; counterfeit; dissemble; conceal.

FEIGN'ING OF DISEASE: practiced somewhat in the army and navy, also by convicts and others anxious to escape from discipline, or procure a discharge from compulsory service. In the army, it is technically called *malingering*. The detection of feigned disease belongs to the educated physician, and is impossible without a thorough knowledge of the reality, unless, indeed, the imitation be very coarse. The diseases most frequently simulated are epilepsy, catalepsy, convulsions, blindness, deafness, palsy, insanity, indigestion, neuralgia, rheumatism, palpitation of the heart, and generally all disorders which may exist without leading to any distinct external appearances. Ulcers of the legs, however, have often been made, and kept open artificially through the application of irritant substances; and vomiting or coughing up of blood is very easily simulated, if the supposed patient can get access to the necessary materials in the slaughter-house or elsewhere. Many men in the public services, and women affected with hysteria, have become so expert as to deceive even men of high character and skill. An instance is on record in which a man submitted to successive amputations of the arm upward, nearly to the shoulder, for an ulcer produced and kept open at will by local applications; and a case was some time ago recorded by Dr. Murchison in the *Medico-chirurgical Transactions*, in which there is no reasonable doubt that a large opening into the stomach was the result of caustic substances deliberately applied to the abdomen, with the view of exciting sympathy.

FEITH, *fīt*, **RHJNVIS**: 1753, Feb. 7—1824, Feb. 8; b. Zwoll, in Overijssel: Dutch poet, ranking next to Bilderdijk (*q.v.*) as a reviver of the national poetry. He studied law at Leyden, and returned to his native town 1776, where

FEKE—FELDMANN.

he held the office of burgomaster. F. tried almost all kinds of poetry. In his earlier productions, he showed excessive inclination for the sentimental; but in 1792 appeared his *Het Graf* (The Tomb), a didactic poem, which, though not free from the weakness referred to, is on the whole happily conceived, and contains some admirable passages. His *De Ouderdom* (Old Age), 1802, is deficient in plan. Among his lyrical pieces, *Oden en Gedichten* (Odes and Miscellaneous Poems, 4 vols. Amst. 1796-1810), are several marked by enthusiasm and warmth of feeling. Of his tragedies, the best known are *Thirza* (1791), *Johanna Gray* (1791), and *Ines de Castro* (1793). Together with Bilderdijk, he recast in nobler form Haren's famous patriotic poem, *De Geuzen* (Les Gueux, or the Beggars), which celebrates the first struggles of the Dutch for independence. Of F.'s prose-works, the most important are *Brieven over verscheiden Onderwerpen* (Letters on Different Subjects, 6 vols. Amst. 1784-90). These Letters, by their polished style and refined criticism, did much to improve the literary taste of Holland.

FEKE, *fēk*, ROBERT: abt. 1725-1769; b. Oyster Bay, L. I.: artist. He was captured and taken to Spain while a boy, developed a natural ability for painting, and earned with his brush his passage to the United States. He settled in Newport, became a portrait painter as early as 1746, and died in the W. Indies. Specimens of his work are owned by Bowdoin College, the R. I. Hist. Soc., and Redwood Library, Newport.

FELANITCHE, *fā-lā-nē'chā*, or FELANITZ, *fā-la-nēch'* (anc. *Canatix*): town of the island of Majorca; 27 m. e. s. e. from Palma. It is in a valley, surrounded by mountains, and is well built, with a number of squares and wide streets. It has a convent and a hospital. On a neighboring hill is an ancient Moorish castle, with subterranean vaults. Linen and woolen fabrics are manufactured; rope-making and brandy-distilling also are carried on. There is some trade in the products of the neighboring country—rice, coffee, sugar, wine, brandy, fruit, and cattle. Pop. 11,018.

FELAPTON, n. *fēl āp'ton* [a mnemonic word]: in *logic*, an arbitrary name for a mode of syllogisms in the third figure, in which the middle term is made the subject of the major and of the minor premise. By this mode we arrive at a particular negative from a universal negative and a universal affirmative. Example: FEL, No A is B. AP, All A is C. TON, Some C is not B.

FELDMANN, *fēlt'mân*, LEOPOLD: 1802, May 22-1882, Mar. 26; b. Munich; of Jewish parents to whose faith he always adhered: German writer of comedies. Apprenticed 1815 to a saddler, afterward to a cobbler, he sent, in a pair of shoes which he had mended, a poetical expression of his devotion to their fair wearer. For this his master sent him back to school, where 1817, when only 15 years old, he wrote a play, *Der Falsche Eid* (The False Oath), which was actually produced on the stage. After a few years in business at Pappenheim, and subsequently in Munich, he

FELDSPATH—FELIDÆ.

was induced, by the reputation which he gained from some humorous pieces, entitled *Genrebilder*, to apply himself entirely to literature. In 1835, his *Höllen-lieder* (Hell-Songs) appeared; and his first comedy, *Der Sohn auf Reisen* (The Son on his Travels), was acted in Munich with applause. While travelling thereafter for five years, chiefly in Greece, he wrote *Pictures of Travel* for Lewald's *Europa*, and the correspondence for the *Allgemeine Zeitung*. In 1841, his comedy was produced in Vienna, and he was histrionic teacher in the National Theatre of that capital 1850–54. F.'s works, which are numerous, are reckoned among the best specimens of modern Germany comedy, pleasing by their cheerful humor, and happy employment of contemporary ideas and events, though deficient in artistic finish. F. published a collection of his comedies, *Deutsche Original Lustspiele* (1844–52; new series, 1855–57).

FELDSPATH, n. *fēl'spāth*, or FELSPAR, n. *fēl'spār*: other spellings of FELSPAR, which see. FELSPATHIC, a. *fēl'spāth'ik*, pertaining to felspar.

FELEGYHAZA, *fā-lēdj-há'zōh*: town of Little Cumania, Hungary, on the railway between Pesth and Temesvar, 67 m.s.e. from Pesth. It has extensive trade in grain, fruit, wine, tobacco, and cattle. In the neighbourhood, several Roman urns have been found. Pop. (1880) 23,912.

FELICITATE v. *fē-lis'ī-tāt* [F. *félicité*—from L. *felicītātē*, happiness—from *felix*, happy: It. *felicita*]: to congratulate on a supposed increase of happiness; to express joy or pleasure at: ADJ. in OE., made happy. FELICITATING, imp. FELICITATED, pp. FELICITATION, n. *-tā'shūn* [F.—L]: congratulation. FELICITOUS, a. *-tūs*, very happy; delightful; very appropriate. FELICITOUSLY, ad. *-lī*. FELICITY, n. *-ī-tī* [F. *félicité*]: great happiness; bliss; the joys of heaven.—SYN. of 'felicity': happiness; beatitude; blessedness; blissfulness; blessing; prosperity.

FELICU'DI: see LIPARI ISLANDS.

FELIDÆ, or FELINÆ: family of digitigrade carnivorous quadrupeds (see CARNIVORA: DIGITIGRADA), corresponding to the genus *Felis* of Linnæus, and sometimes collectively called *cats* or the *cat tribe*. They are, generally speaking, the most carnivorous of all the *Carnivora*, holding the same relative place among quadrupeds that the *Falconidæ* do among birds. Their organization is admirably suitable to their habits. They have a very lithe muscular frame; the body is rather long, and remarkably flexible; the limbs generally short. Few of the species possess much fleetness, but most of them excel in climbing and in leaping. When moving rapidly over the surface of the ground, they generally advance by a series of zigzag bounds, rather than by direct running. They are mostly inhabitants of forests, and many even of the larger species live much among the branches of the trees, though some of the largest do not leave the ground. They all advance stealthily on their prey, which all of them kill for themselves, and devour in a perfectly fresh state, and generally while still warm and quivering. When they have ap-

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proached within a sufficient distance, they complete the seizure by a spring, many of them uttering a roar or yell as they do so, and thus rendering their victory more secure by the consternation which paralyzes the object of their attack. Their movements are extremely noiseless, owing to the soft velvety pads with which their toes are provided. Their claws are strong, much curved, very sharp, and retractile; being withdrawn by special muscles and ligaments into sheaths when not in use, and their points even turned upward, so that they are not blunted by unnecessary friction, and do not interfere with the movements of the animal by accidentally hooking objects which are in the way. The last bone (*phalanx*) and joint of the toe exhibit peculiarities requisite for the extension and retraction of the claws. The fore-feet have five toes, the hind-feet four. The head of the F. is characterized by great breadth of skull, while the muzzle is short, and sometimes even rounded; the jaws are moved by very powerful muscles, and the articulation of the lower jaw is such that it has no rotatory motion; the teeth also being so shaped, and those of the two jaws so fitting to each other, that they cut like scissors—the lower teeth shutting within the upper—and are not at all adapted to the trituration of food. There are six small incisors in each jaw, followed on each side by one very large canine tooth, adapted for prehension; and this is followed by two præmolars, or false



Characteristic Features of the Felidæ:

1, tiger's head; 2, showing the dentition; 3, portion of tongue; 4, right fore paw, showing claws; 5, claw, showing tendons.

molars, which, particularly in the lower jaw, are compressed and sharp-edged, their edges rising to a central summit, with inferior lateral cusps, so that flesh between them is subjected to a cutting action in various directions. Finally, there is on each side of each jaw one true molar, and in the upper jaw of many species, a second true molar. The crowns of all the teeth are covered with enamel. The

FELINE—FELIX I.

tongue is rough, with horny papillæ directed backward, by which it is fitted for cleaning the bones of the prey. The stomach is simple, the intestines short, and digestion rapid. The senses of sight and hearing are extremely acute; the eyes are adapted to seeing both by day and by night; the sense of smelling also is very acute, though apparently not equal to that of dogs; the sense of taste is supposed to be less acute; the bulbs from which the long whiskers arise appear to possess the sense of touch in great perfection, and the whiskers thus become useful in the progress of the animal through entangled thickets.

The F. agree so much in form and structure, that many naturalists still refuse to divide the Linnæan genus *Felis*. None of the F. are gregarious. Almost all, when taken young, seem capable of domestication, but in general they are little to be trusted. The species are numerous. They are distributed over Europe, Asia, Africa, America, and the islands adjacent to these continents; but none are found in Australia, where their place is supplied by the carnivorous marsupial quadrupeds. The largest species are found chiefly in warm climates. No species is known to be common to the Old and New worlds, though some are very nearly allied.

Vast numbers of the larger F. were brought from Africa and the East for those savage sports and shows in which the ancient Romans delighted. 500 lions were slain in five days at the opening of Pompey's theatre, and 500 panthers have been 'let loose' at once in a similar Roman arena. The wealth of Indian princes has often been spent in fights of such beasts.

For the principal F., see LION: TIGER: JAGUAR: PUMA: LEOPARD: PANTHER: CAT: TIGER-CAT: LYNX: CHEETAH: OUNCIE: CARACAL: SERVAL: OCELOT, ETC.

FELINE, a. *fē'lin* [F. *fēlin*—from L. *fēlinus*, belonging to a cat—from *fēlis*, a cat: It. *fēlino*]: pertaining to the cat kind; like a cat. FELIDÆ, n. plu. *fē'lidē*, the cat family, including the lion, tiger, and cat. FELIS, n. *fē'lis*, a Linnæan genus of animals corresponding with Felidæ.

FELIX, *fē'lik*s I., Pope of Rome: d. prob. 274 (ruled prob. 269—prob. 274); reckoned the 26th in the succession of popes: succeeded Dionysius in the see of Rome. His pontificate is interesting chiefly as an early example of the relations of the Christian Church to the Roman empire, and of the recognition by the state of the civil rights of Christians. In the pontificate of Felix's predecessor Dionysius, Paul of Samosata, Bp. of Antioch, had been deposed by a council held in that city. Paul having resisted the sentence, the matter was laid before Felix, Dionysius being now dead; and, as Paul held possession of the church and church buildings, the bishops were obliged to claim the interference of Emperor Aurelian, who was passing through Antioch on his return from Palmyra. Aurelian returned a decision often appealed to in modern controversy, to the effect that the buildings should belong to the person 'to whom they should be adjudged by the bishops of Italy

FELIX II.—FELIX.

and Rome.' Felix afterward suffered martyrdom in the persecution of the same emperor, Aurelian.

FELIX II., Pope of Rome: occupied the Roman see during the banishment of Liberius, 355. It is agreed on all hands that his first appointment was intrusive, but much diversity of opinion exists as to his subsequent career. In reply to a petition for the recall of Liberius, it was proposed by Emperor Constantius that Liberius and Felix should exercise jurisdiction jointly; but this proposition was rejected by the Romans, and Felix appears to have been compelled to retire from the city. According to the *Liber Pontificalis*, he suffered martyrdom in the end, at the hands of his former patron, Constantius; but this is not confirmed by any contemporary authority.

FELIX III., Pope of Rome: b. Rome, of the family from which afterward sprang Pope Gregory the Great; d. 492, Feb. 24 (ruled 483-492). His pontificate is historically memorable, as presenting the commencement of the disruption of the Greek and Roman churches. The contemporary occupant of the see of Constantinople, Acacius, as well as the imperial court, was a favorer of the Monophysite party, who refused to accept the decision of the council of Chalcedon: see MONOPHYSITES. By their influence, the patriarch of Alexandria was deposed, and replaced by the monophysite Peter Mongus. The deposed patriarch having appealed to Rome, Felix sent two legates to Constantinople, to require his restoration; and the legates having failed in their trust, and Acacius still adhering to the heterodox party, Felix assembled a council at Rome, and communicated not only the offending legates, but also Acacius himself, the sentence being pinned by a monk upon the back of the patriarch's robes while he was actually officiating in the church. Felix had previously rejected the *Henoticon*, or Decree of Union, published by Emperor Zeno. The schism thus inaugurated was not healed till 519. The only literary remains of this pontiff are the letters and other acts of this controversy.

FELIX IV., Pope of Rome: b. Benevento; d. 530 (ruled 526-530); successor of John I. His pontificate presents no noteworthy event.

FELIX V. (anti-pope): see AMADEUS.

FELIX, ANTONIUS: a Roman procurator of Judæ (51-62 A.D.) in the time of the Apostle Paul, was a freedman of the Emperor Claudius I. The circumstances under which he received his appointment are related differently by Tacitus and Josephus. His government, politically considered, was in some respects good. According to Josephus and other authorities, he cleared the country of robbers, and vigorously suppressed the chaotic seditions of the Jews; but his cruelty, lust, and greed were unbounded. His wife was Drusilla, a beautiful but renegade Jewess, whom he had induced to abandon her first husband, and to form a questionable connection with himself. It was therefore not at all wonderful that F. should tremble, as Paul reasoned of 'righteousness, temperance, and judgment to

FELIXIANS—FELLAH.

come' (Acts xxiv. 25). He was recalled to Rome, 62 A.D., on account of the accusations preferred against him by the influential Jews of Cæsarea, and narrowly escaped the sentence of death.

FELIXIANS, *fē-lik'si-anz*: Spanish sect of the latter part of the 8th c., so-called from Felix, Bp. of Urgel. See ADOPTIAN CONTROVERSY.

FELL, v. *fēl*: pt. of FALL, which see.

FELL, a. *fēl* [It. *fello*; OF. *felle*, fierce, cruel: L. *fel*, gall: Gael. *feall*, treachery: W. *gwâl*, defect]: cruel; barbarous; fierce; dreadful: N. in *OE.*, gall. FELL'NESS, n. cruelty; savageness; fury. FEL'LEST, a. superl. very cruel; most barbarous. FELL'y, ad. *fēl'li*, in a savage manner; inhumanly.

FELL, v. *fēl* [Icel. *fella*; Dut. *vellen*, or *velden*, to fell or cause to fall]: to bring to the ground; to knock down; to hew or cut down. FEL'LING imp.: N. the act of one who cuts down trees. FELLE'D, pp. *fēld*. FEL'LER, n. one who.

FELL, v. *fēl* [Gael. *fill*, to fold, to plait: Sw. *fall*, a hem]: to turn down, as a seam: N. in *weaving*, the end of a web formed by the last thread of the weft.

FELL, n. *fēl* [Goth. *fill*; Icel. *fell*; Dut. *vel*; L. *pellis*, skin]: a skin or hide. FELL'MONGER, n. a dealer in hides.

FELL, n. *fēl* [Icel. *ffjall*, or *fell*; Dan. *field*, a mountain—originally an open flat down]: a low-browed hill; a mountain; a mountain-side; in *OE.*, a moor; an elevated bleak tract. SHEEP-FELL, in *OE.*, an elevated open flat for sheep.

FELLAH, n. *fēl'lä*, FEL'LAHS, or EL FEL'LAHIN, n. plu. *lä-hēn* [Arabic word meaning peasant or agriculturist]: specially applied to the peasant tillers of the soil in Egypt by the Turks, in a contemptuous sense, as 'clowns,' or 'boors.' There seems a curious coincidence between *fellah* and the accepted etymology of *fellow*. They form the great bulk of the population, and are descendants of the ancient Egyptians, intermingled with Syrians, Arabs, and other races who have been converted to Islam. In their physical conformation and features, they differ among themselves, those of the n. provinces of the Mediterranean being of whiter hue, while at Assouan they are almost black. They are described as having a large skull, facial angle almost 90 degrees, oval face, arched eyebrows, deep eyes, projecting lips, large mouth, thin beard, short nose, large chest, and small belly; arched back, and small hands and feet, and being of mean height. They form the fourth class of the population, and are distinguished from the Bedouin or free Arabs, who have entered the country later than the Saracenic conquest, and the Arabs of the town and villages. Their dress consists of a shirt and linen drawers, over which is a larger blue shirt (*herie*), girdled by a leather or stuff belt, which is exchanged in winter for a coat with sleeves (*zabout*). On their head they wear the *tarboush*, turban, or a black or gray cap; the

FELLATAHS—FELLENBERG.

women tattoo themselves, and are nubile at an early age, being often married at 11 years, mothers at 12, and grandmothers at 24. The food of the Fellahin consists entirely of vegetables, which they eat in a crude state, dhourra bread, and beans. Even rice is too dear for them, and animal food unattainable. Their drink is limited to the waters of the Nile and coffee, and the only luxury which they enjoy is the green tobacco of the country; yet on this diet they are robust and healthy, and capable of much labor and fatigue. In their social position they are inferior to the Bedouin, who, though they will marry the daughters of the Fellahin, will not give to them their own in marriage. They appear to exhibit the moral qualities of the ancient Egyptians, being intelligent, grave, and calm, docile, pliable, and sober on the one hand; and idle, jealous, quarrelsome, satirical, licentious, and of unbending obstinacy on the other, and inherit the traditional hatred of their ancestors to the payment of taxes, which are often extorted only by the bastinado. Their political condition is most miserable. Each village is governed by a Sheik-el-Beled, responsible to the Nazirs and Mamours, or district officers, for the conduct of the inhabitants, and their due payment of taxes. So oppressive, indeed, is the taxation and extortion, scarcely one-twentieth of the produce falling to their lot, that it would not be possible for them to live if it were carried to a higher pitch, and none cultivate the lands with diligence unless compelled by their superiors.—Gliddon, *Types of Mankind*, p. 319; Lepsius, *Egypt and Ethiopia*, p. 76; Lane, *Manners and Customs of Modern Egyptians*, pp. 125, 126, 192, 193; Clot Bey, *Aperçu générale*, I., pp. 159, 160.

FELLA'TAHS, or FOU'LAHS: see FULAHS.

FELLENBERG, *fèl'en-berg*, Gr. *fèl'en-bèrch*, PHILIP EMANUEL VON: 1771–1844, Nov. 21; b. Bern: founder of the institution for the improvement of education and agriculture at Hofwyl in the canton of Bern, Switzerland. His father was of patrician rank, and in consequence, a member of the government. From him F. received a very careful education; but it was his mother, great-granddaughter of the famous Dutch admiral, Van Tromp, who inspired him with the desire of usefulness. In 1789, he went to the univ. at Tübingen, for the study of law, and subsequently travelled in Europe, taking up his quarters not in the hotels of the large towns, but in the cottages of peasantry, that he might know the real condition and manners of the agricultural laborers, as well as the kind of education received by them. When the revolution of 1798 broke out in Switzerland, F. took part in it; but the faithlessness and want of public spirit on the part of the Bernese government induced him to withdraw from political life. He then purchased the estate of Hofwyl, near Bern, and soon entered into an alliance with Pestalozzi, the educationist. Their different characters, however, rendered the union impracticable, and they found it necessary to separate. F. proceeded with redoubled zeal to increase the produce of his estate by new improvements. to influence the

FELLOE—FELLOWS.

neighborhood by his example, and to make his experiments known to the world by his agricultural treatises. At the same time, he founded an asylum for forsaken children. He also opened a school of theoretical and practical agriculture, and connected with it an institution for the education of the children of the higher classes. The establishment at Hofwyl acquired very great reputation, and pupils hastened to it from all quarters. Many foreign princes visited it, and on their return to their own countries, founded similar institutions. In 1830, F. founded a school of art, and some years later, an infant school. The institutions at Hofwyl were continued for some years by his son Wilhelm, and then given up. Compare Hamm, *F.'s Leben und Wirken* (Bern 1845).

FELLOE, n. *fě'l'ō*: see FELLY 2.

FELLOW, n. *fě'l'ō* [OE. *felaw*: Icel. *fēlagi*, a partner in goods; *fēlag*, companionship, association—from *fē*, goods; *lag*, society, a law: comp. Gael. *balaoch*, a lad—said to be from *ba*, cows; *laoch*, a lad]: a person or thing joined or associated with another; a companion; one of a pair; one of the same kind; a name of commiseration, kindly interest, or contempt; in a learned society, one who holds a higher status than that of a member; a member of a college who is on the foundation and receives an income from its revenues: V. in *OE.*, to pair with; to match. FEL'LOWSHIP, n. companionship; society; the position and emoluments of a fellow; in *college or univ.*, see below: in *business*, see PARTNERSHIP. FELLOW-CREATURE, a human being; one of the same race. FELLOW-COMMONER, in *Univ. Camb.*, a student, usually married or wealthy, who, at extra charge, formerly dined at the 'commons' and associated with the fellows; known at Oxford as gentleman-commoner (see COMMON, etc.). FELLOW-COUNTRYMAN, a native of the same country. FELLOW-FEELING, sympathy, joint-interest.

FELLOWS, *fě'l'ōz*, Sir CHARLES: 1799–1860, b. Nottingham, England; antiquary. In the beginning of 1838, he commenced his travels in the East. His researches were chiefly in the w. peninsula of Asia Minor, and in the region of the ancient Xanthus, in the s. of that peninsula. In the valley of the Xanthus, he discovered, only nine m. from the coast, the ruins of the city of Xanthus, former cap. of Lycia. 14 or 15 m. higher up the river, he found the ruins of another city, which, from inscriptions, he found to be the ancient Tlos. F. returned to England, and published *A Journal written during an Excursion in Asia Minor, by Charles Fellows*, 1838 (Lond. 1839). In 1839 he again visited Lycia, and in another excursion discovered the ruins of 13 cities. Another journal, *An Account of Discoveries in Lycia, being a Journal kept during a Second Excursion in Asia Minor* (Lond. 1841), was the result of this journey. In 1841, an expedition left England to select works of art from the ancient cities discovered by F., who accompanied and directed the expedition. Another expedition sent out by the trustees of the British Museum brought home 20 cases of marbles and casts. 1844. These

FELLOWS—FELLOWSHIP.

remains are in the British Museum, in the Lycian Saloon. In 1845, F.'s labors were rewarded by knighthood. The other works of F. are—*The Xanthian Marbles: their Acquisition and Transmission to England* (1843); *An Account of the Ionic Trophy Monument Excavated at Xanthus* (1848); a re-issue of his earlier Journals under the title of *Travels and Researches in Asia Minor, particularly in the Province of Lycia* (1852); and *Coins of Ancient Lycia before the Reign of Alexander; with an Essay on the Relative Dates of the Lycian Monuments in the British Museum* (1855).

FELLOWS, *fél'ôz*, JOHN: 1733–1808, Aug. 1; b. Pomfret, Conn.: soldier. He served in the French and Indian war; was elected a member of the provincial congress of Mass. 1775; organized and led a regt. of minute-men to Boston directly after the fight at Lexington; was commissioned brig.gen. in the continental army 1776, June 25; and was in command of a brigade in the battles of Long Island, White Plains, and Bemis's Heights. After the war he settled in Sheffield, Mass., and was sheriff of Berkshire co. several years.

FELLOWSHIP, IN A COLLEGE or UNIVERSITY: position and emoluments of a Fellow. For the history of this institution, see UNIVERSITY. In the two great universities of England—Oxford and Cambridge—the fellowships were either constituted by the original founders of the colleges to which they belong, or they have been since endowed. In almost all cases, their holders must have taken at least the first degree of bachelor of arts, or student in the civil law. One of the greatest changes introduced by the commissioners under the University Act of 1854, was the throwing open of the fellowships to all members of the univ. of requisite standing, by removing the old restrictions by which many of them were confined to founder's kin, or to the inhabitants of certain dioceses, archdeaconries, or other districts. Fellowships used to vary greatly in value, some at Oxford being worth £700 or £800 in good years (varying with the revenues of the college lands), and some being less than £100, both at Oxford and at Cambridge. Many fellowships were tenable for life, but they were in general forfeited, should the holder attain to certain preferments in the church or at the bar. In general, also, they were forfeited by marriage, unless a special vote of the college removed the disability in any given case. But of late, great changes have been made in withdrawing restrictions as to marriage, limiting the stipends, and reducing the tenure to a definite period of years. Thus at Cambridge, under the statutes of 1881, the restrictions as to celibacy and holy orders are wholly removed; the stipend is limited in most colleges to £250 per annum (exclusive of certain allowances); and the tenure is not to be longer than six years, except in the case of fellows who occupy a university or college office. So long as fellows perform university or college functions, they may hold their fellowships. The fellowships confer on their holders the privilege of occupying apartments in the college, and generally, in addition,

FELLY—FELO DE SE.

certain perquisites as to meals or commons. With the single exception of Downing College, Cambridge, in which the graduates of both universities are eligible, the fellowships are confined to the graduates of the university to which they belong.

In the United States, according to the annual report of the U. S. commissioner of education for 1894-5, there was a total of 338 fellowships in 481 institutions reporting. The institutions having the greatest number were Univ. of Chicago 91; Columbia College 37; Cornell Univ. 22; Johns Hopkins Univ. 21; Harvard Univ. 21; Clark Univ. (Mass.) 20; Vanderbilt Univ. (Tenn.) 15; Yale 12; Univ. of Wisconsin 10. At the same time there were 5,731 *scholarships*, of which the greater part provide only for free tuition, though some pay a large part of a student's expenses. Johns Hopkins Univ. had both fellowships and scholarships; the former are bestowed annually upon 21 students, as an encouragement to apply all their time to the special studies in which they had shown proficiency; the latter are granted (1) according to the founder's will to studious candidates from Md., Va., and N. C., who are educated free of charge, (2) as honors to meritorious students, (3) to 10 bachelors of art of the univ. and 10 graduates of any institution who may engage in the prosecution of special work at the univ. All the scholarships carry free tuition, and, some have an additional stipend.—In some institutions the fellows are the members of the board of trustees who have charge of the business affairs.

FELLY: see under FELL 2.

FELLY, n. *fě'l'li*, FELLIES, n. plu. *fě'l'li:z* [AS. *felgu*; Ger. *felge*; Dut. *velghe*; Dan. *fælge*, a felly]: one of the curved parts of the wooden rim of a cart or carriage wheel, usually covered with an outer iron rim. FELLIES, n. plu. the whole rim: also spelled FELLOE, n. *fě'l'lō*. FEL'LOES, n. plu. *-lōz*. FELLY-COUPLING, n. a box for inclosing the adjacent ends of fellies in the rim of a wheel. *Note*.—The FELLY is so named from the pieces of the rim being stuck or put together end to end: AS. *feolan*, to stick.

FELO DE SE, *fě'lō dē sē'* [mid. L. a felon upon himself]: in *English law*, a person who being of the age of discretion, and *compes mentis*, voluntarily kills himself, committing felony by suicide (see FELON). 'No man,' says Sir M. Hale (*Pl. of the Cr.* 411), 'hath the absolute interest of himself, but 1st, God Almighty has an interest and propriety in him, and therefore self-murder is a sin against God; 2^d, The king hath an interest in him, and therefore the injunction in case of self-murder is *felonice et voluntarie se interfecit et murderavit contra pacem domini regis*.' A man or woman is considered of full age in regard to capital offenses at the age of 14. A lunatic killing himself during a fit is not guilty of F.; but a merely melancholy and hypochondriacal temperament is not such a state of mind as will relieve a person from the consequences of this offense. Where two persons agree to die together, and in pursuance of this design one or both die, it is suicide, or *felo de se*.

FELON—FELSPAR.

And in some cases, where one maliciously attempts to kill another, and unwittingly kills himself, this is said (Hawkins, P. C. c. 27, s. 4) to be *felo de se*. But as a general rule the act must be voluntary. Formerly, the law in England punished this offense by inflicting ignominy on the body of the offender, which was ordered to be buried by night at four cross-ways, and that a stake should be driven through the body. But this ignominious mode of burial is abolished, and a F. may be interred in cemeteries or churchyards with the usual funeral rites, if a clergyman consents to perform them. All the chattels, real and personal, of a F. are forfeited to the crown. See SUICIDE.

FELON, n. *fēl'ōn* [F. *fēlon*, cruel—from mid. L. *fēlōnem*, a felon: Bret. *fall*, bad, wicked: comp. Gael. *feall*, treachery, treason; *feallan*, a traitor—connected with *fell*, cruel]: one who has committed a crime punishable with forfeiture of goods and other penalty; a name for malignant whilow: ADJ. pertaining to a felony; cruel; inhuman. FELONY, n. *fēl'ō-nŭ*, a crime punishable with the forfeiture of goods and estates and other penalty; in *law*, every species of crime which occasions the forfeiture of land and goods; a crime in general. FELONIOUS, a. *fē-l'ō-nŭ-ŭs*, done with intention to commit crime; malignant. FELONIOUSLY, ad. *-lŭ*. FELONOUS, a. *fēl'ō-nŭs*, in *OE.*, felonious; perfidious; traitorous.—*Felony* (a word whose origin is ultimately cognate with Lat. *fallere* and Eng. *fail*), prob. had for its original signification the act of a vassal who failed in his fidelity or allegiance to his superior, thus committing an offense by which he forfeited his fee or feud. From this it came to signify traitorous or rebellious, and was gradually generalized till it reached its popular meaning of a crime of so heinous a nature as to infer a capital punishment. The characteristic distinction of a felony, in the opinion of all legal writers, is, that it is a crime which occasions the forfeiture of the offender's goods. Treason itself, says Sir Edward Coke, was anciently comprised under the name of felony. . . . And not only all offenses now capital are in some degree or other felony, but . . . many other offenses not punishable with death, as suicide, manslaughter, and larceny, as they submit the committers of them to forfeitures.' A convicted felon forfeits and is disqualified for any government or public office.—SYN. of 'felon n.': convict; criminal; culprit; malefactor.

FELSPAR, n. *fēl'spār* [Ger. *feldspath*, rock-spar—from *feld*, a field; *spath*, spar]: an important rock-forming mineral, consisting chiefly of silicate of alumina, along with other silicates; a white, greenish, or flesh-colored mineral, generally hard and brittle, and sometimes glassy—one of the chief ingredients of granite. FELSPATHIC, a. *-spāth'ik*, of the nature of felspar; containing felspar.—*Felspar* is extremely abundant in almost all parts of the world. It is a principal constituent of many rocks, as granite, gneiss, greenstone, trachyte, etc.; and clays seem very generally to have resulted in great part from its decomposition. It oc-

FELSPAR.

curs both massive and crystallized, in rhomboidal, pyramidal, and prismatic crystals, often having their edges and angles truncated, and thus very variously modified. There are many different kinds of F., which mineralogists have recently attempted to arrange in mineral species, distinguished by physical and chemical characters, and also by geognostic position, and by the groups of minerals with which they are associated. For these mineral species new names have been invented, *Orthoclase*, *Oligoclase*, *Albite*, *Labradorite*, etc. All the feldspars are anhydrous silicates of alumina, and of an alkali or lime. Orthoclase, and the other more silicious feldspars containing potash, abound chiefly in granite and the *plutonic* rocks; the less silicious, containing soda and lime, characterize the *volcanic* rocks—‘as labradorite the basaltic group, glassy feldspar the trachytic.’ All the kinds of F. are so hard as not to be easily scratched with a knife, and are fused with difficulty. Some of them are soluble, some insoluble in acids.—The kind known as COMMON F.—referred to *Orthoclase*—is generally white or flesh-colored, has a glassy and somewhat pearly lustre, is translucent at least on the edges, and has an uneven or splintery fracture. Crystals four or five inches long are found. This variety, under the name of *Petunse* or *Petuntze*, is used by the Chinese in the manufacture of porcelain; together with some of the quartz which is associated with it in the rock. It is used, with other materials, as a flux; and alone to form an enamel or glassy covering, without which the porcelain would absorb moisture and grease, and would be unfit for any except mere ornamental purposes.—**ADULARIA** (q.v.) is a transparent and almost colorless variety of F., often cut as an ornamental stone, the finest varieties, of which one is known as **MOONSTONE**, being prized almost as gems. A variety, found among rolled stones in Ceylon, and remarkable for the reflection of a pearly light, has been sometimes confounded with *Cat's Eye*.—**AVANTURINE F.** is similar to the variety of quartz called *Avanturine* (q.v.) in the play of light which it exhibits, and which is said to be owing to minute crystals of specular or titanite iron. It is much esteemed as an ornamental stone. A variety with golden yellow specks, called **SUNSTONE**, is very rare and very beautiful: it sells at a high price.—**LABRADORITE** (q.v.) exhibits rich colors and a beautiful opalescence, on account of which it is much used for ornamental purposes.—A blue variety of F., found only in Styria, and a green variety, sometimes called *Amazon Stone*, are also esteemed as precious stones. All the finer varieties of F. are characterized by a soft beauty, which well compensates for the want of that brilliancy which belongs to the true gems.—*Kaolin*, or *Porcelain Clay*, is regarded as a decomposed feldspar.—To F. also are referred, as chiefly composed of it, or apparently derived from it, *Felstone*, *Trachyte* (q.v.), *Claystone*, *Clinkstone* (q.v.), *Pitchstone* (q.v.), *Obsidian* (q.v.), and *Pumice* (q.v.).—**FELSTONE**, n. -stōn, or **FELSITE**, n. -sīt, name introduced by Prof. Sedgwick to designate eruptive rocks composed, in whole or large extent, of fel-

FELT.

spar. When they consist of a compact and apparently amorphous felspar, they are known as Trachytes—a variety of this rock, which splits into small slabs, that ring with a metallic sound, is called Phonolite. Trachyte, with distinct crystals of felspar scattered through it, becomes felstone porphyry; when the rock is in a vitreous condition, and has a resinous lustre, it is Pitchstone. Even in the most compact felstones, minute crystals may be detected, and these sometimes of such size as to form varieties completely granular and crystalline.

FELT, *fëlt*: pt. and pp. of the verb FEEL, which see.

FELT, n. *fëlt* [Ger. *filz*; Dut. *vilt*; It. *felze*, felt: mid L. *feltrum*, a heavy cloth felted with wool: comp. Gael. *falt*, hair, matted hair (see FELL 5)]: the hide with its fur; cloth or stuff made of hair, wool, or other substance, by rolling and pressure, and not by weaving: V. to make cloth of hair, wool, or fur, by causing the material to mat together by means of pressure, rolling, or hammering. FELTING, imp.: N. the act or process. FELTER, n. one who. FELTED, pp.: ADJ. worked into felt. FELTLING, n. *fëltling*, the substances employed in lining puddling furnaces which are used for the production of malleable iron.—*Felt*, of hair and wool, is a fabric formed without weaving, by taking advantage of the natural tendency of the fibres of hair and wool to interlace with and cling to each other. The hatters' tradition concerning the invention of felt illustrates the principle of this manufacture. In most Rom. Cath. countries, the hatters celebrate as a festival Nov. 23, St. Clement's Day; and it is stated that St. Clement, when on a pilgrimage, put carded wool between his feet and the soles of his sandals, and found on his journey's end that the wool was converted into cloth. Although this tradition is very questionable, as the manufacture of felt is of far more ancient origin, there can be no doubt that if carded wool were thus continually trodden, and at the same time moistened, it would become felt, and all the manufacturer's processes of felting are but modifications of such treatment. This matting or felting of the fibres of hair and wool results from their structure, for, when examined by the microscope, the hair of all animals is found to be more or less jagged or notched on its surface; in some animals it is distinctly barbed; and this structure is so directed that the teeth or barbs all point towards the tip of the hair: see HAIR. If a piece of human hair (in which this structure is less marked than in most animals) be held between the finger and thumb, and rubbed in the direction of its length, it will invariably move between the fingers in the direction of its root; for the skin, while moving toward the tip of the hair, slides freely upon it, but moving in the other direction, against the inclination of the barbs, it brings the hair with it. It will be easily understood that when a number of hairs are pressed together, those which lie in opposite directions to each other and in contact will interlock at these barbs or teeth, and thus resist any effort to tear them asunder. When once this close contact and in-

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terlocking is established between any two or more hairs, they remain attached, but the others that are differently arranged, or not in contact, will still be free to move upon each other; and therefore, if subjected to continual blows, pushing, and pressure, like the treading of the feet in walking, the unattached hairs will be continually shifting until they reach others in suitable positions for clinging together either by crossing obliquely or by lying in the same line, and overlapping at their ends or any other portion. When the hair has a natural tendency to curl, the felting is still more readily brought about by the additional interlacing. This is the case with wool to such an extent, that when free from grease it cannot be retained in the straight carded condition required for spinning and weaving. When it is required to be felted, the natural grease has to be removed. This tendency to felt is shown in the hard lumps formed in wool-mattresses long used. The beaver-hat maker produces his felt by taking a few ounces of the mixed fur, distributing it in an even layer by twanging a bowstring against the heap, and then condensing this into a felt by a sort of kneading process with his hands: see HAT.—The felt now extensively used for carpeting and other purposes is made by machinery, chiefly from the waste wool from the weaving-mills. Many patents have been taken out for the various details of felting-machinery, but the main principle is the same in all. The wool is carded more or less perfectly, steamed or moistened with hot water, and passed between beaters which act like the pilgrim's feet. When used as drugget for covering carpets, or as a substitute for carpet, the felt is printed by means of blocks with various patterns, or simply dyed. Felt is used also for padding coats and other garments, sometimes for cloaks and capes; for table covers, some of which are beautifully embossed and printed; for carriage-linings, upholstery work, polishing cloths, pianoforte hammers, and various other purposes where a coarse or thick cloth is required. A simple kind of saddle, cut out of very thick felt, is common in S. America.

The 'felted sheathing' used as a non-conducting covering for retaining the heat in steam-boilers, is a substance intermediate between felt and paper, being composed of the commonest woolen refuse from paper-mills, etc., made into a semi-pulp, and beaten to produce a partial felting. This when dried hardens, and though having little tenacity and unfit for the wear of friction, has a compactness which adapts it to its purposes.—*Asphalted Roofing-felt* is a very coarse felt saturated with pitch, asphalt, or coal-tar—usually the latter for cheapness; it is sold at a very low price and used for covering sheds and other buildings. A more expensive kind, free from coal-tar, called *Inodorous Felt*, is used as a lining for damp walls on which paper is to be hung. Asphalted felt is used also as a flooring for granaries and similar buildings, and has been recommended for public schools, to prevent the noise from the shuffling of the children's feet.

FELT GRAIN. in *wood-work*, the grain of wood whose

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direction is from the pith to the bark; the direction of the medullary rays in oak and some other timber.

FELTON, *fě'l'ton*, CORNELIUS CONWAY, LL.D.: president of Harvard College, and Greek scholar: 1807, Nov. 6—1862, Feb. 26; b. West Newbury, Mass.: author. He graduated at Harvard Univ. 1827, and became Latin tutor there 1829, Greek 1830, Eliot prof. of Greek 1832, and pres. 1860. He was a member of the American Acad. of Arts and Sciences, and the Mass. board of education, and regent of the Smithsonian Institution. Though he spent but a single year abroad (1853—4), he was an enthusiastic student of art and an accomplished Hellenist from early life. He was author of a number of Greek text-books, published *Homer, with English Notes and Flaaxman's Illustrations* (1833); *Menzel's German Literature*, 3 vols. (1840); the *Clouds* of Aristophanes (1841); *Classical Studies*, in connection with Sears and Edwards (1843); *Poets and Poetry of Europe*, in connection with Longfellow (1845); translated Guyot's *Earth and Man*, and edited the *Panegyricus* of Isocrates and *Agamemnon* of Æschylus (1849); edited the *Birds* of Aristophanes (1852); revised and continued to date Smith's *History of Greece* (1855); published *Selections from Modern Greek Writers* (1856); and left for posthumous publication *Familiar Letters from Europe* (1864); and *Greece: Ancient and Modern*, 2 vols. (1867).

FELTRÉ, *fě'l'trá*: town of n. Italy, province of Belluno, near the right bank of the Piave, 44 m. n.n.w. of Venice. It suffered severely from the attacks of the Goths in the 5th c. The chief buildings are the cathedral, the college, ecclesiastical seminary and gymnasium. F. has some trade in corn, wine, and oil. Pop. 6,500.

FELTRE, *fě'l'trá*, MARTO DA.: abt. 1474—1519: real name PIETRO LUZZO; b. Feltre, Italy: painter. Little is positively known about him, and few of his works remain. It is believed that he received his art education in Venice and spent the greater part of his life in Rome. He made prolonged studies in catacombs, grottoes, and subterranean remains, formed a style of fanciful arabesque painting which gained the name of *grotesche*, whence comes *grotesque*; and is believed to have received his sobriquet 'the dead man of Feltre' because of his melancholy temperament and singular line of study. His works were received with much favor

Rome. He painted a number of fine grotesques in the Palazzo Pubblico, Florence, and, in conjunction with Giorgione, in the Fondaco dei Tedeschi, Venice; and, during a visit to his birth-place, executed some charming frescoes, still partly extant, in the loggia beside San Stefano. The church at Villabruna contains an altar-piece by him, representing the Virgin seated on a cloud, holding the child, who gives the benediction, with SS. George and Victor below. The Berlin Museum also has one of his paintings, an allegorical subject of peace and war. Other reputed works are of doubtful origin. F. is charged with having broken the heart of Giorgione, his master, by eloping with his wife, and is said to have been killed in the

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battle at Zara, while an officer in the service of the Venetian republic.

FELUCCA, n. *fē-lŭk'kā* [It. *feluca*; Sp. *faluca*; Ar. *fulk*, an open boat, a ship]: small sailing vessel common in the Mediterranean; propelled by 10 to 16 oars, and by lateen sails. It has frequently a rudder at each end, to be applied as occasion demands. In war, feluccas armed with a heavy gun or two, and sent out as gun-boats against ships that are becalmed, have been found very troublesome; from their speed in smooth water and the difficulty of hitting them.

FEMALE, n. *fē'māl* [F. *femelle*—from L. *femella*, a female—from *fēminā*, a woman]: one of that sex which conceives and brings forth young: **ADJ.** not male; pertaining to the sex that brings forth young; delicate. **FEMALE-SCREW**, a spiral-threaded cavity into which another screw turns; the nut. **FEMININE**, a. *fēm'i-nīn* [F. *fēminin*—from L. *fēminīnus*, feminine]: belonging to the female sex; womanish; tender; delicate: **N.** in *gram.*, a noun or name of the female gender; in *OE.*, woman. **FEMINITY**, n. *fēm-īn'i-tī*, the qualities of character pertaining to women. **FEMME-COUVERTE**, *fām-kŭv'ért*, or **FEME COVERTE** (see below) [F. *femme*, a woman; *couvert*, covered]: in *law*, a married woman. **FEMME-SOLE'**, *-sŏl'* [OF. *sole*; L. *solus*, alone]: in *law*, an unmarried woman. **FEMALE RHYMES**, double rhymes, or having added syllables—so named because in French they end in *e* weak or feminine. **FEMALIZE**, v. *fē'māl-īz*, to invest with the qualities or character of a female; to emasculate. **FEMALIZING**, imp. **FEMALIZED**, pp. *-īzd*.

FEME COVERTE, *fēm kŭv'ért*, or **FEMME COUVERTE** (*fēmīno viro co-operta*): in *law*, a married woman. See **MARRIAGE: HUSBAND AND WIFE**: etc.

FEMERELL, n. *fēm'er-ĕl* [F. *fumerelle*—from *fumer*, to smoke; L. *fumus*, smoke]: in *arch.*, a louvre, lantern, or covering placed on the roof of a kitchen, hall, etc., for the purpose of ventilation or the escape of smoke.

FEMERN, *fā'mèrn*: island in the Prussian province of Schleswig-Holstein, taken from Denmark 1864. It is separated from Holstein by a strait called the Femern Sound, has 70 sq. m.; is flat, fruitful, and destitute of wood. Agriculture, fisheries, and stocking-weaving for exportation, are the principal employments of the inhabitants. The chief town is Burg, pop. (1881) 2,962. Pop. of the island, abt. 10,000.

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FEMGERICHTE or **VEHMGERICHTE**, *fām'gēh-rīch-tēh* [from the old German *fem*, punishment, and *gericht*, court of justice]: spoken of as the Holy Feme (or Fehme), and as the Westphalian or Secret Tribunals: among the most remarkable phenomena of the middle ages, and supplied the place of the regular administration of justice, then in a deplorable condition. The origin of these courts has been ascribed to Charlemagne, who, it was pretended, had instituted them to prevent the relapse into Paganism of the Saxons who had been forcibly converted to Christianity. It is more probable, however, that they were a relic of the ancient German free courts of justice, the preservation of which may have been favored in Westphalia by special circumstances.

When Henry the Lion was put under the ban of the empire, and deprived of his possessions 1179, Westphalia, which then comprised nearly the whole district between the Rhine and the Weser, was granted to the Abp. of Cologne; and from this time the secret tribunals gained in importance. In the general confusion in Germany, when all laws, civil and ecclesiastical, had lost their authority, and the fabric of society seemed on the point of toppling into ruins, the F. were organized for the purpose of arresting the incipient anarchy that threatened to bring chaos back again, and of inspiring with salutary terror through their mysterious powers and solemn judgments, all rapacious and lawless persons (but especially the feudal barons), who were committing crimes without legal check. Thus, in the causes of their formation, and in general design, the F. resemble the Hanseatic towns. They soon acquired tremendous influence, the emperors themselves having recourse to their assistance against powerful and rebellious nobles. In the 14th and 15th c. they attained the summit of their dread authority, when they began to extend themselves over the whole of Germany. Beneficial as in many instances they proved to be, they could not fail, in the long-run, to degenerate, and to be frequently employed as a cloak to self-interest and malice. Many voices, therefore, were raised against them, and in 1461 various princes and cities of Germany, as well as the Swiss confederates, formed unions for affording justice to every individual, and preventing any from seeking it from the secret tribunals. Particular classes likewise obtained imperial letters of protection against the pretensions of these tribunals. The emperors themselves, however, could go no further than to make some unavailing attempts to introduce improvements into the constitution of the F., as the latter were bold enough to oppose the imperial authority, and even summoned the emperor Friedrich III. to appear before them. Their influence came to an end only when the public peace (*Landfriede*) was established in Germany, and an amended form of trial and penal judicature was introduced. The last real F. was held at Celle, in Hanover, 1568. A remnant of the institution, however, existed in Westphalia until 1811, at which time it was performing the function of a society for the sup-

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pression of vice, when it was abolished by an order of Jerome Bonaparte. Beyond the limits of Westphalia, notwithstanding all their endeavors, the F. never succeeded in fully establishing their authority; and even in the *Red Land*, as Westphalia was called (probably from the color of the soil), they were restricted by the imperial privileges on which they founded their authority.

The members of the F. were called *Wissende*, 'knowing ones,' or the *initiated*. It was necessary that they should be born in wedlock, be of the Christian religion, lead a blameless life, and bind themselves by a tremendous oath 'to support the holy Feme, and to conceal it from wife and child, father and mother, sister and brother, fire and wind, from all that the sun shines on and the rain wets, and from all that is between heaven and earth.' Originally, none but an inhabitant of the 'Red Land,' possessed of real property, could be admitted a member of the *Wissende*; later this rule was relaxed. From the general body were elected officers called *Freischöffen* (free justices), who were assessors of the court, and executors of its sentences. The presiding judge was called the *Freigraf* (free count). The general superintendence and presidency of the secret tribunals belonged to the lord of the land—i. e., in Westphalia, to the Abp. of Cologne. The highest office, however, as supreme president, was nominally held by the emperor, who was usually elected into the number of the *Wissende* on the occasion of his coronation at Aix-la-Chapelle. The court of a *Freigraf* was called *Freiding* (a free court of justice), and the place where he held court a *Freistuhl* (free bench or court). One of the most celebrated free courts had its seat at Dortmund. The sittings of the tribunal were either open or secret. The former were held by day in the open air, and decided in civil disputes: the secret tribunals took cognizance of those who had been unable to prove their innocence in the open courts, as well as of those who were accused of heresy, sorcery, rape, theft, robbery, or murder. The accusation was made by one of the *Freischöffen*, who declared, upon oath, that the accused had committed the crime. The citation was secretly affixed, with symbolical signs, to the door of the accused, who was to meet the *Wissende* at a certain hour and place, and be conducted by them before the tribunal. The accused could now clear himself by an oath, but the accuser and witnesses could oppose this with another. If the accused could now bring forward six witnesses to swear in his favor, the accuser could strengthen his oath with 14 witnesses; and it was not till after 21 witnesses had made their affidavit in his favor that sentence of acquittal necessarily followed. The persons convicted, as well as those who refused to obey the summons, were given over to the *Freischöffen*. The first *Freischöffe* who met him was bound to hang him on a tree, or, if he made any resistance, to put him otherwise to death. A knife was left by the corpse, to show that it was not a murder, but a punishment inflicted by one of the *Freischöffen*. Compare Wigand, *Das Fehmgericht Westfalen's* (Hamm. 1825), and Usener,

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Die Frei- und heimlichen Gerichte Westfalen's (Frankfort 1832); Geisberg, *Die Fehme* (1858).

FEMORAL, a. *fēm'ō-rāl* [mid. L. *femorālis*—from L. *femur*, the thigh, *fēmōrīs*, of the thigh: It. *femorale*; F. *fémoral*, pertaining to the thigh]: pertaining to the thigh. **FEMUR**, n. *fēm'ūr*, a thigh-bone; the largest and longest bone of the body (see **SKELETON**). **FEMORAL ARTERY**, an artery lying in front of the thigh, being a continuation of the external iliac.

FEN, n. *fēn* [Icel. *fen*, a morass: Dut. *veen*; Goth. *fani*, mud: comp. Gael. *feannag*, a ridge of ground]: low, marshy, or boggy ground, covered wholly or partially with water. **FENNY**, a. *-nī*, pertaining to a fen. **FENS**: see **BEDFORD LEVEL**. **FEN-FIRE**, n. the Will-o'-the-wisp, an ignis fatuus.

FENCE, n. *fēns* [F. *défendre*, to forbid; *défense*, prohibition: an abbreviation of *defence* (see **DEFEND**)]: a boundary composed of a hedge, or line of posts, or stakes driven into the ground; an inclosure; guard; security; the art of fencing: V. to inclose with a hedge, or a wall of posts; to protect or guard; to defend by giving and avoiding blows, as with a foil or sword. **FENCING**, imp.: N. fences, or the materials used to form them; the act or art of skilfully using a foil or sword in attack or defense. **FENCED**, pp. *fēnst*, inclosed by a wall of posts; fortified. **FENCER**, n. *-sēr*, one who. **FENCIBLE**, a. *fēn'si-bl*, capable of defense. **FENCELESS**, a. uninclosed. **FENCIBLES**, n. plu. *-si-blz*, soldiers for home service only, or regiments raised only at and for a special crisis; sometimes, however, the local as distinguished from the general militia; also, some volunteer corps. The only British regiment remaining with this title is the 'Royal Malta Fencible Artillery.' **FENCE-MONTH**, n. the fawning month during which deer-hunting is forbidden. There are also fence-months for various kinds of fishes, as trout, salmon, etc. A **FENCE**, among *burglars*, the person who buys stolen property. **RING-FENCE**, a fence or wall entirely surrounding an estate. **FENCING THE TABLES**, in the *Scotch Presb. Churches*, address by the officiating clergyman to those about to partake of the elements of the Eucharist or Lord's Supper, solemnly pointing out to them the conditions for communicating worthily, and the sins which disqualify and exclude.

FENCE, in Agriculture: guard or barrier along a boundary-line, inclosing animals on pasture-grounds, and protecting land from straying animals. They are of great variety of materials, and of very different structure. Where wood or stones are scarce, as in many countries long settled, hedges, formed of various kinds of plants, are common. These, well kept and managed, give a clothed and picturesque appearance to the landscape. The hawthorn is the well-known hedge-plant of Britain: see **HEDGES**. When stones are used as fences, they are built as walls.

In new countries, where trees abound, fences are mostly of wood. The snake-fence, named from its zigzag form, is

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made of rails, 12-16 ft. long. The end of the lower rail is laid upon a block or stone and the others are piled above. The deflection from a right line varies from five to eight ft. Stakes are usually placed at the corners, under the top rail, to increase the height and to strengthen the fence. Post and rail fences require less timber and encumber only about one-third as much land as rail fences, but involve more work to build and are not so durable. In some parts of the country post and board fences are more popular than either of the above. Wire fences are the cheapest and most efficient and are now the most extensively built. There are about 50 different patents. The most common form is made of two twisted steel wires with barbs inserted at intervals of six or eight inches. Posts are set 16-35 ft. apart, and from two to five strands of wire are fastened to them by staples made for the purpose.

Law regarding Fences.—By common law each owner of live stock was obliged, either by fencing or otherwise, to keep his animals on his own land. But the statute laws regarding fences vary greatly in different states. In most, if not all, of the states officers called 'fence-viewers' are chosen by the various towns, to whom disputes relating to fences may be referred. In the newly settled portions of the country cattle are allowed to run at large, and crops must be protected from them by suitable fences or no claim for damages can be sustained. The height of a legal F. is four ft. in some states and five ft. in others, being determined by the legislature. In sections where the law does not allow cattle to roam at will the owner of a cultivated field is not obliged to fence it, and no road-side fences are required. If cattle damage the crops or the land, even if there is no F., the owner of the stock must pay therefor. This, however, does not fully apply where cattle are being driven along the highway. In such cases if the owner of the cattle has a proper number of drivers, is reasonably careful, and as quickly as possible drives the animals from the field, on which they are trespassing, he is not liable for damage done while they were temporarily beyond his control. But if cattle accidentally escape from a pasture, as when a gate is left open (even though it be opened by a trespasser), their owner is responsible for any damage that they may do. Animals trespassing in fields legally fenced, or in open fields in sections where fencing is not required, may be taken as estrays by the proprietor of the land, but if their owner is known he must be promptly notified. In some localities the cattle can be held until the damages, which should be appraised by disinterested parties, and the necessary costs, are paid; but in all cases the animals must be properly cared for by the man who has them in charge. Partition fences are to be built and maintained by the parties owning the fields which they separate, each paying one-half the cost of construction and repairs. These fences should always be on the boundary line. If either party neglects to keep his portion of the fence in repair the other should notify him that repairs are needed. If the notice is disregarded he can

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make the necessary repairs and collect from the negligent party a fair remuneration for the same. If one of the owners wishes to allow his land to remain idle he cannot be required to build or repair any portion of a partition fence. In this case the party desiring to crop his land must build and maintain the entire fence until the other party brings his land into cultivation.—See TRESPASS: also FIXTURES.

FENCING: art of defending one's own body or assailing another person's in fair fight by the aid of a side-weapon—i.e., by a sword, rapier, or bayonet. Technically, F. is usually limited to the rapier; and works on the art treat only of attack and defense with the foil in pastime, and the rapier in actual personal combat. In a general consideration of F., however, the elements of single combat with foil, sword, and bayonet have a place. The objection formerly existed that instruction in F. encouraged a propensity to duelling; but as that absurdest of absurd customs is passing away with the advance of civilization, the objection is not now important. F. may therefore be safely learned and taught as an elegant and manly accomplishment, developing gracefulness and activity, while it imparts suppleness to the limbs, strength to the muscles, and quickness to the eye. This regards fencing with the foils (the rapier has disappeared with the duels which employed it); but instruction in fencing with the sword and bayonet, while conferring the same advantages, has in addition the recommendation of helping to fit the student for taking an active part in any general national defense. The Foil (q.v.) is a circular or polygonal bar of pliable and very highly tempered steel, mounted as any other sword, and blunted at the point by a 'button,' to prevent danger in its use. From its nature, the foil can be employed only in thrusting, and, being edgeless, it can be handled without liability to cutting wounds. The length of the blade should be proportioned to the height of the person using it—31 inches being the medium length for men, and 38 inches from hilt to point the maximum allowable. As a protection against accidental thrusts, the face is generally guarded by a wire-mask. The two portions of the blade are known as the 'forte' and the 'feeble;' the first extending from the hilt to the centre, and the other from the centre to the point.

In drawing, advance the right foot slightly to the front, take the scabbard with the left hand, raise the right elbow as high as the shoulder, seize the hilt with right hand, nails turned inward, and having drawn the foil, pass it with vivacity over the head in a semicircle, and bring it down to the guard (of which presently) with its point toward the adversary; not higher than his face, nor lower than his lowest rib. Simultaneously with the weapon being brought into position, the left hand with fingers extended should be raised to a level with the head, as a counterpoise in the various motions to ensue. In establishing the position of guard, the right foot must be advanced 24 inches before the left, the heels in a straight line, and each knee slightly bent, to impart elasticity to the movements, but

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not too much, lest the firmness of the position be diminished.

In F., there are three openings or entrances—the *inside*, comprising the whole breast from shoulder to shoulder; *outside*, attackable by all the thrusts made above the wrist on the outside of the sword; and the *low parts*, embracing from the armpits to the hips. For reaching and guarding these entrances, there are five positions of the wrist—prime, seconde, tierce, carte (quarte), and quinte. The most important, and those to commence with, are carte and tierce, from which are derived the subordinate positions of carte over the arm, low carte, and flanconnade or octave. To *engage* is to cross swords with your adversary, pressing against his with sufficient force to prevent any maneuver taking you unawares. To *disengage* is to slip the point of your sword briskly under his blade, and to raise it again on the other side, pressing in a direction opposite to that of the previous case. The *guard* in each position is a passive obstruction to the opposing thrust; the *parade* is an active obstruction, in which the guard is first assumed, and the blade then pressed outward or inward by a turn of the wrist against the adversary's sword, so that when thrust at your body it shall be diverted from its aim, and held off. The parade may therefore be regarded as a mere extension of the guard. If the parade were called the 'parry,' it would convey its meaning more readily to English ears. Another, and perhaps more appropriate name for thrust is the 'lunge' or 'longe,' as the thrust is almost always accompanied by a lunge forward of the right foot, to give at once greater force and longer command to the blow.

The following are directions for the principal guards and thrusts.

Carte, Guard.—Turn wrist with nails upward; hand on a line with lower part of breast; arm somewhat bent, and elbow inclined a little to the outside; point of foil elevated at an angle of about 15°, and directed at upper part of adversary's breast.

Thrust.—Being at the guard in carte, straighten the arm, raise the wrist above the head, drop the foil's point to a line with the adversary's breast, throw first the wrist, and then the whole body, forward by a lunge with the right foot of two ft. from the 'guard,' the left foot remaining firm. The left hand should be dropped during the lunge to a level with the thigh, and to a position distant about 12 inches from the body; it will then afford a good counterpoise to the sword-arm. During the whole action, the body must be perfectly upright. When performed briskly, it appears that the point and foot are advanced simultaneously, but in fact the point has, or should have, priority, in order that the instantly following lunge may drive it home. Most of these observations concerning thrust in *carte* apply equally to all other thrusts.

Carte over the arm is a variety of this thrust. The sword is driven outside the adversary's blade, from the carte position, but in the tierce line.

Low Carte.—Engage adversary's blade in carte, then drop

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point under his wrist, in a line to his elbow, and thrust at his flank, the body being considerably bent.

Flanconnade or Octave.—Engage adversary's blade in carte, and bind it with yours, then carry your point behind

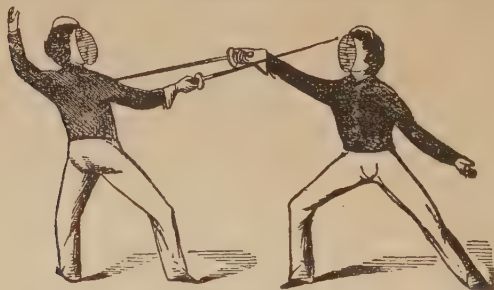


Fig. 1.—Carte.

his wrist and under his elbow: without quitting his blade, plunge your point to his flank.

Tierce, Guard.—As in carte, the nails and wrist being somewhat more downward, and the arm stretched a little outward, to cover the outside.

Parade.—Move arm, from the guard, obliquely downward to the right about six inches, and oppose the inside of the adversary's blade.

Thrust.—From the guard, turn wrist with nails downward, the same height as in carte, the inside of the arm in a line with the right temple; then thrust and lunge as in carte.

Seconde, Parade.—Nails and wrist downward, hand opposed outward, and blade, pointing low, should form an angle of about 45° with the ground.

Thrust.—The same as tierce, but delivered under the adversary's wrist and elbow, to a point between his right

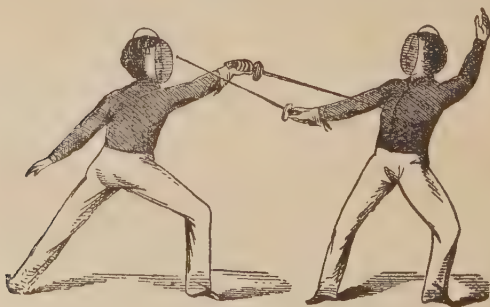


Fig 2.—Tierce.

armpit and right breast: the body to be more bent than in carte or tierce.

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Prime, Parade.—In using prime to parry the thrust in seconde, pass your point over the adversary's blade, lower it to the waist, keeping your wrist as high as your mouth,

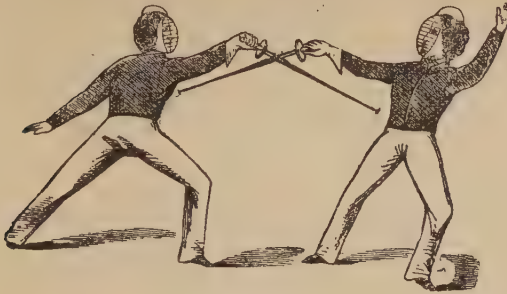


Fig. 3.—Seconde.

nails downward, elbow bent, and body held back as far as possible. The left foot should also be drawn backward a few inches, to remove the body further from the hostile point.

Thrust.—An extension movement from the parade.

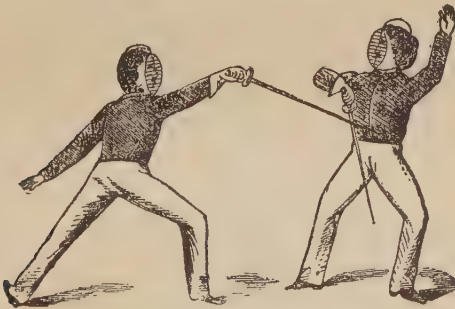


Fig. 4.—Prime.

Quinte, Parade.—Wrist in high carte, sword-point low, and oppose adversary from the forte of the outside edge of your blade.

Thrust.—Make a feint on the half-circle parade, with the wrist in carte; disengage your point over the adversary's blade, and thrust directly at his flank.

Half-circle, Parade.—One of the principal defensive parades: straighten arm, keep wrist in line with shoulder, nails up: by quick motion of wrist sweep point from right to left in a circle covering your body from head to knee, until the adversary's blade is found and opposition established.

The parades parry thrusts as follows:

Carte, with wrist low, parries low carte and seconde;

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with wrist raised, all the thrusts over the point on the inside of the sword and the flanconnade.

Tierce parries, high carte; with raised wrist, parries tierce

Seconde parries all lower thrusts, both inside and outside.

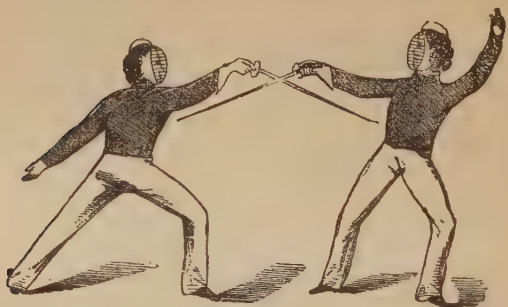


Fig. 5.—Quinte.

Half-circle parries carte, high carte, tierce, and seconde.

Prime parries carte, low carte, and seconde.

Quinte parries seconde and flanconnade.

In all parades or parries, care must be taken that in covering the side attacked, the parade is not so wide as to expose the other side to the enemy. A steady countenance, showing no disquietude at any attempt he may make, is, above all, necessary in parades.

Every parade has its return, which should be made with vivacity and decision. A thrust can be returned when the adversary thrusts, or when, baffled in his attack, he is recovering to his guard. In the first case, no lunge is necessary, the return being made from the wrist: this return requires great skill and quickness, since the adversary should receive the thrust before, by finishing his own, he has touched your body.

Ordinary Returns.—After carte parry, return in carte; after tierce, return in tierce; after parrying high carte, return seconde; after parrying seconde, return in quinte; after parade in prime, return seconde or low carte.

Feints, of which there are many varieties, consist in threatening an attack on one side of the sword, and then executing it on the other. The best parade against a feint is that of the half-circle, which will be sure to find the adversary's point.

Advance and Retreat are motions of attack or withdrawal, performed by advancing the right, or withdrawing the left foot suddenly about 18 inches, and instantly following it with the other foot. As the adversary advances, you must retreat, unless prepared to receive him at the sword-point.

Salute.—The salute is a courteous opening of the fencing, and consists in gracefully taking off the hat, while, with the foils, your adversary and yourself measure your respective distances.

Appels or beats with the right foot, *beats* on the adversary's blade, and *glissades* or glidings of one sword along the

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other, are motions intended to confuse the enemy, and give openings for thrusts.

Voltes, *demi-voltes*, and *disarming*, were maneuvers formerly taught with care, but now quite discarded in the academies of England and France, as useless and undesirable.

In Spain and Italy, considerable differences of practice from that in France and England prevail. The left hand is used as an auxiliary in parrying, and in Italy is aided by a dagger, or sometimes a cloak. The Spaniard, though trusting to his sword and left hand only, has his blade five feet long, with sharp edges; his guard is nearly straight, and one of his favorite attacks is by a *cut* (not thrust) at the head.

In actual practice, there are endless variations of the different modes of attack and defense, which will be severally adopted according to the skill and option of the fencer. There is no finer indoor exercise than F., as the muscles in every limb are developed and strengthened by it. The great requirements for success are a steady eye and hand, a quick purpose as quickly executed, and, perhaps above all, perfect equanimity of temper.

THE SWORD EXERCISE differs from fencing with the foil in that the weapon employed has one cutting edge, as well as a point, and is therefore intended to cut and thrust. The sword is the arm, often the only arm, of officers in the army and navy, and of many non-commissioned officers. A certain degree of proficiency in its use is therefore always serviceable. In practice, the usual substitute is a stout, straight stick, called a 'single-stick,' having a basket-handle to protect the knuckles.

The position of the combatant is the same as that assumed in fencing with the foil; the lunge is similar, as are also the 'advance' and 'retreat,' and other minor points. Ac-

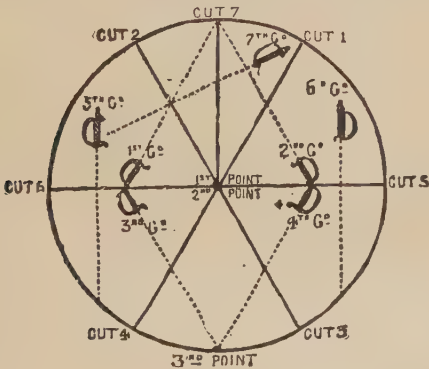


Fig. 6.

cording to the instructions of drillmasters, there are seven cuts, with seven corresponding guards, and three thrusts. The theoretical directions of all these are shown on the

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accompanying diagram, which represents a target placed opposite a pupil, so that he may see the motions he is expected to perform displayed before him. The centre of the target is supposed to be in a line with the centre of his breast.

The cuts proceed from the circumference towards the centre along the *thick* lines. Nos. 1, 3, and 5 are inside cuts, and attack the left cheek, left side, and inside of the right leg respectively; 2, 4, and 6 are outside cuts, attacking the enemy's right cheek, right side, and right leg on the outside. No. 7 is a vertical cut, aimed at the head.

The dotted lines show the position of the sword in the several guards by which the cuts are opposed. The sword-handles illustrate the situation of the right hand with reference to the centre of the body.

The points or thrusts are shown by the black circles. That toward No. 1 should be directed with the wrist and edge of the sword upward to the right; toward 2, with the edge upward to the left; and, in the 3d point, with the wrist rising to the centre, and the edge upward to the right.

The parry' is an additional defensive movement, and consists in bringing the wrist nearly to the right shoulder; whence, as centre, a circular sweep of the sword is made from left to right.

A considerable latitude is allowable in regard to the cuts, as to the part of the adversary's body at which they are directed, provided the general inclination of the blow be observed; similarly, the cut may at times be parried by a guard other than that intended specially for it, according to the discretion of the fencer.

In engaging, or joining swords, with the enemy, press the blades but lightly together, so that the hand and wrist may be readily susceptible of any motion. In making the guards, care must always be taken to receive, if possible, the feeble of the enemy's blade on the forte of your own, so as to offer the greater opposition. It should also be borne in mind that, in all cuts at the leg, when at proper distance, the shifting of your own leg, and delivering a cut at the same moment, becomes the most effectual and advantageous defense, particularly if you happen to be taller than your adversary, as you will then probably be out of his reach, while he is within yours.

In contending with bayonet or pike, the most effectual guard is the 5th, which, if well timed, enables the swordsman to seize the musket or pike with his left hand, and then make the 6th cut at his opponent's neck. In an encounter with the rapier, the best cuts are Nos. 3 and 4, as they attack the enemy's arm, which must be advanced within reach before he can touch your body, and also constitute a defense against his thrust. If the enemy—no matter how armed—be on horseback, the dismounted swordsman (provided he have proper nerve and agility) has decidedly the advantage. Endeavor to place yourself on his left, where he has less power of defending himself or his horse, and cannot reach to so great a distance as on his right: an attack on the horse will probably render it

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ungovernable, and it becomes easy then to avoid the rider's blows, while he himself may be attacked with impunity in almost any direction.

BAYONET EXERCISE.—A proper command of the bayonet is indispensable to the soldier in any close contest. In close quarter engagements, there is no weapon more formidable from its length and weight, the thrust of the bayonet gives a terrible wound, and its force is such that there is great difficulty in parrying the attack. Like other small-arms, it is most serviceable when handled on scientific principles; and the art of using it to advantage is so simple as to be easily acquired, while the exercise, from the weight of the rifle, admirably aids in developing the muscles of all parts of the body.

Of course, the bayonet is always fixed at the end of the musket, when it becomes virtually a pike. The position of the feet in the bayonet exercise remains always the same relatively, and absolutely until advance or retreat be effected. The right foot is thrown back 24 inches, and the weight of the body thrown upon it. The heels are kept in a line with each other, both knees bent and well apart; the right knee directly over the foot, the left easy and flexible, pointing to the front. In this position of the body, all the defensive motions of the bayonet are made. In 'guard,' the bayonet is brought nearly to a horizontal direction, level with the waist, and pointing toward the breast of an advancing enemy. Similarly, to 'guard,' the positions 'low,' 'high,' and 'second point' are assumed, the bayonet pointing as shown by the dotted lines in Fig. 7. The butt

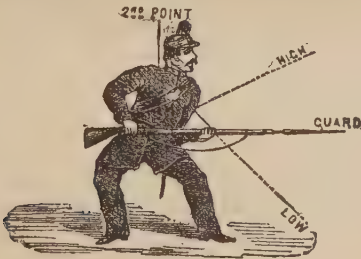


Fig. 7.

of the rifle is always kept well to the right side, the hand behind the trigger-guard, and the whole body in attitude to offer great resistance. In 'low,' the barrel is turned downward; but in all the other defensive motions it is held upward. The position of the arms is in each case that which would naturally be taken in placing the bayonet and musket in the required direction.

The offensive position of the body is acquired by the extension of the right leg, and bending forward of the left without moving the feet. The butt of the rifle is at the same time pressed firmly to the shoulder. This position is called 'point,' and constitutes an extension of the

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weapon in a direction parallel with either of those previously taken. As there were four 'guards,' so there are four points, which are shown in fig. 8. The barrel is in

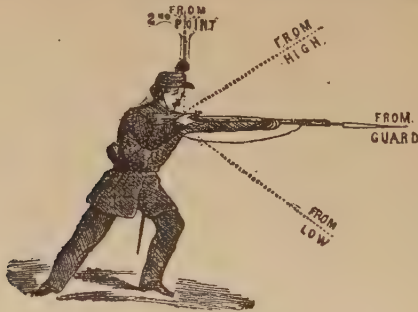


Fig. 8.

each case upward, and the motions for each are similar, except in pointing from '2d point,' when the rifle, seized by the right hand round the small of the butt, is thrust straight up above the head to the full extent of the arm, the left hand falling along the thigh, and the legs straightened so as to form an isosceles triangle.

'Shorten arms' is a useful motion, both as a defense and as a preparation for a strong attack. It consists in carrying the butt back to the full extent of the right arm, while the barrel (downward) rests upon the thick part of the left arm. The body is thrown upon the right leg, and the left straightened. This powerful position is seen in the annexed cut.

In all the guards and points, and also 'shorten arms,' the bayonet may be turned directly to the front, to the right, or to the left, as circumstances may suggest. In contending with a swordsman, the action of changing



Fig. 9.

from right to left, when at the 'high' or 'low,' is sufficient defense against the ordinary cuts of the latter.

Among the treatises consulted for this article have been the works on fencing by Angelo and Roland, as well as the shorter instructions issued by the military authorities.

FEND—FÉNELON.

FEND, v. *fënd* [contr. of DEFEND, which see]: to ward off; to prevent from entering; to parry a charge. **FEND'-ING**, imp. **FEND'ED**, pp. **FENDER**, n. *fënd'er*, that which defends; a metal article placed on the hearth before the fire; a piece of timber or coil of rope hung over a ship's side to prevent injury from rubbing against another surface. **FENDER-BEAM**, n. the horizontal beam into which the posts of a saw-mill gate are framed at top; the inclined advance piece of an ice-breaker. **FENDER-BOLT**, n. in *ship-build.*, a bolt having a large head, which projects from the planking and serves as a fender to save the planks from being bruised. **FENDER-POST**, n. one of the guiding stanchions of a saw-gate. **FENDER-STOP**, n. in *r. r. eng.*, a structure at the end of a line of rails, to stop the cars or engine.

FÉNELON, *fën'eh-lon*, F. *fā-nūh-lōng* or *fān-lōng'*, FRANÇOIS DE SALIGNAC DE LA MOTHE, Archbishop of Cambray: 1651, Aug. 6—1715, Jan. 7; b. in the château de Fénelon, province of Périgord, now in the dept. of the Dordogne; of a family which has given many celebrities to the church and to the state in France. His education was conducted at home till his 12th year, when he was transferred to Cahors, and afterward to the Plessis College in Paris. At the close of a most blameless collegiate career, he selected the priesthood as his profession, and entered, in his 20th year, the newly founded seminary of St. Sulpice, then under the celebrated Abbé Tronson, where he received holy orders 1675. Unlike many ecclesiastics of his own rank at that period, he gave his whole heart to his sacred calling. For some time after his ordination, he was employed in attendance at the hospitals, and in other parochial duties of the parish of St. Sulpice; and 1678 was named director of an institution recently founded in Paris for the reception of female converts to the Rom. Cath. faith. While in this office, he wrote his first work, *On the Education of Girls*, still a standard; and the gentleness, moderation, and charity with which he discharged his duties toward the young converts, led to his appointment as head of a mission, which, on the revocation of the Edict of Nantes 1685, was sent to preach among the Prot. population of Saintonge and Poitou. In 1688, he resumed his duties in the Maison des Nouvelles Converties, at Paris; and in the following year, he was named by Louis XIV. to the highly confidential post of preceptor of his grandson, the young Duke of Burgundy. F.'s management of this important and delicate trust showed how well he understood the true nature and objects of education. All his own instructions, and all the exercises enjoined upon his pupil, were so contrived, as, both to impart actual knowledge, and to prepare the mind and the heart of the pupil for the business of his life, by impressing him with a sense of responsibility of the great principles of truth and justice on which these responsibilities are founded, and of the hollowness and futility of all earthly glory, power, and happiness, which do not rest upon this foundation. To this wise design of the preceptor we are indebted for many works still popular in educational use; for the *Fables*, for the

Dialogues of the Dead, for the *History of the Ancient Philosophers*, for the germ at least of the *Telemachus*, and for the *Life of Charlemagne*, the manuscript of which last work, unfortunately, was burned in the fire which destroyed the archiepiscopal palace of Cambrai, 1697. As an acknowledgment of these great merits, he was presented by the king, 1694, to the Abbey of St. Valery, and in the following year, to the Archbishopric of Cambrai, which he accepted only on the express condition, that for nine months of each year he should be exempted from all duties as preceptor of the prince, and left at liberty to devote himself exclusively to his diocese. It is to this period of F.'s life that the history of the unhappy controversy about Quietism belongs. Without entering into the details of this singular revival of the ancient Mysticism (see MYSTICISM), it will be enough to say that two separate schools of Quietism are to be distinguished, the moral character, or at least the moral tendency, of which was exceedingly different: see QUIETISM. In one of these, the common mystic principle of the absorption of the soul in the love and contemplation of God, led to the conclusion, that the soul, in this state of absorption, became entirely passive; that it was thenceforth independent of the external world; that it suffered no contamination from the material actions of the outer man, and that no acts of virtue, not even of prayer, were any longer required: see MOLINOS. The other school, while it maintained the theory of passive contemplation and love, yet repudiated the dangerous and immoral consequences deduced therefrom. It was exclusively the latter and less objectional form of Quietism, whose professors for a time claimed, though not the patronage, yet at least the indulgent consideration of Fénelon. He formed, 1687, the acquaintance of the celebrated Madame Guyon, foundress of the French school of Quietism: see GUYON. The extraordinary piety and exemplary life of this remarkable woman, and his own natural bias toward the tender and lofty spirituality which he professed, appear to have blinded F. to the true nature and to the practical consequences of the system which she followed. Fully convinced of the unfairness of much of the outcry which was raised against her, and which made her responsible for all the principles of the grosser Quietism of Molinos, his generous mind was perhaps attracted to her cause by the very injustice of her opponents. He advised her to submit her works to the judgment of Bossuet, then in the zenith of his fame, with whom F. was in the most friendly relations. In the condemnation of the book of Madame Guyon by this prelate, F. acquiesced; but as she made a formal submission to the church, he refused to join in any condemnation of herself personally. Nevertheless, when a commission was appointed to examine the whole affair, F., though not a member, took part in the proceedings; and even suggested certain changes in their report, which he subscribed in common with the rest. To the articles prescribed for her signature by this commission, Madame Guyon readily subscribed; but it was further considered necessary not only

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to publish a condemnation of her several works, but also to prepare a special exposition of the true doctrine of the church on these questions. When the work of Bossuet on this subject was completed, he submitted it to F. for his approval. This F. not only refused to give, but even composed his own *Maxims of the Saints in the Interior Life*, in explanation and defense of certain at least of Madame Guyon's doctrines. He submitted his book to the Abp. of Paris, and introduced into it some modifications which were suggested by the diocesan censors, cheerfully agreeing to the stipulation of the abp., that it should be kept back from publication until the completion of the rival treatise of Bossuet, *On the States of Prayer*. An unfortunate violation of this engagement, committed without the knowledge, and in the absence of F., was the last of a long train of causes which led to the painful and unedifying rupture between these two great prelates. F.'s book was received with much clamor, that of Bossuet was universally approved; and in the controversy which ensued, all the weight of the displeasure of the court, which F. had provoked by the covert strictures upon the existing state of things, in which he was believed to have indulged in his works of fiction, was brought to bear against him. He was ordered to submit his book to the judgment of an ecclesiastical tribunal, of which Bossuet was a member. F. refused to accept Bossuet as judge, on the ground that he had already prejudged the cause; and in the end he appealed to the judgment of the holy see. Unfortunately, even while the affair was pending at Rome, the controversy was still maintained in France. Bossuet published a succession of pamphlets. Several of the bishops who had espoused the side of Bossuet, issued pastorals in the same sense. F. defended himself vigorously against them all in several publications, explanatory as well of his principles as of the personal imputations in which some of his adversaries did not scruple to indulge. The last blow against the ancient friendship of the great rivals was struck by Bossuet in his celebrated *Relation sur le Quétisme*. F. was wounded to the heart. The copy of Bossuet's pamphlet which first came into his hands is still preserved in the British Museum; and the margin is literally filled with remarks, annotations, replies, denials, and rejoinders, in the singularly delicate and beautiful hand writing of the indignant archbishop. The copy in the British Museum is most probably one which, as we learn from his correspondence, he sent to his agent at Rome, and on the margin of which he corrected, for the guidance of his friend, the many false and exaggerated charges of his great antagonist. The substance of these replies he gave to the public in a most masterly defense, written, printed, and published within little more than a fortnight from the appearance of Bossuet's *Relation*. From this point, the controversy assumed a more personal, therefore a more acrimonious character; and it was maintained on both sides till the long delayed decision of the pope brought it to a close, 1699, March 12, by a brief, in the usual form, condemning the *Maxims of the Saints*, and

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marking with especial censure 23 propositions extracted from it. The conduct of F. under this blow constitutes, in the eyes of his fellow-churchmen, one of his highest titles to glory. He not only accepted, without hesitation, the decision of Rome, but he took the earliest occasion to publish from his own pulpit the brief of his condemnation; he issued a pastoral address to his flock, to apprise them of the judgment of Rome, and of his own cheerful acquiescence; and he presented to his cathedral a magnificent piece of church-plate, a gold ostensory, in which the Angel of Truth is represented trampling under foot many erroneous works, the most prominent of which bears the title of *Maxims of the Saints*. Bossuet is said to have been greatly touched by the conduct of his noble adversary, and to have earnestly desired a reconciliation. But the adverse influence of the king, Louis XIV., and of the court, stood in the way. The jealousy with which the political principles of F. were already regarded was heightened about this time into open hostility by the appearance of his *Telemachus* printed from a copy surreptitiously obtained by his servant, and which the king regarded as a masked satire on his own court: Sesostris being supposed to represent the Grand Monarque himself; Calypso, Madame de Montespan, Protesilaus, Louvois; and Eucharis, Mademoiselle de Fontanges. Louis's anger knew no bounds. F. was strictly restrained within his diocese; measures were taken to give the condemnation of his book every character of publicity; and what wounded him most of all, all intercourse with him, whether personal or by letter, was forbidden to his old and much-loved pupil, the Duke of Burgundy. From this date, F. lived exclusively for his flock. He founded at Cambray a seminary for his archdiocese, which he made his own especial charge. He was assiduous in preaching, and in the discharge of the other duties of his office; and the fame of his benevolence, charity, and enlightened liberality is attested by the order given in the campaign of 1709 to spare the palace and the stores of the Abp. of Cambray. The only later controversy in which he appears is the revival of the Jansenistic dispute in the well-known form of 'The Case of Conscience' (see JANSEN), in which F. engaged earnestly on the side of orthodoxy. The young Duke of Burgundy, notwithstanding the prohibition of his grandfather, retained all his old affection for his preceptor; and the highest hopes were entertained as to the future career of the pupil of such a school. These hopes were cut short by the premature death of the duke, 1712. F. survived him only about three years.

The works of F. are very voluminous. The latest collected edition extends to 20 vols. 8vo, and embraces great variety of subjects—theology, philosophy, history, literature, ancient and modern, oratory, especially the eloquence of the pulpit, asceticism, and spirituality in all its branches. His correspondence is very extensive and most interesting. Of his early sermons (one of which was delivered in his 15th year), a volume was printed 1744. Of his mature discourses, two only have reached us in a

FENESTELLA—FENESTER.

finished state. They are of the very highest order of sacred eloquence. Of the rest, we can judge only from the skeletons which it was his habit to prepare with great exactness, and of which very many have been preserved. His literary and historical works, many of which were composed for the instruction of his pupil, are filled with allusions and suggestions illustrative of the principles of government and of the relative duties of sovereigns and subjects, far in advance of the time in which he lived. His work on the *Temporal Power of the Medieval Popes* presents that doctrine in its most amiable form; and even his spiritual writings in general may be read, and indeed are frequently read, not only without offense, but with positive advantage, by Christians of all denominations. See Card. Bausset's *Histoire de Fénelon* (3 vols. 1808-9); also *Vie de Bossuet* of the same author. See also the Life prefixed to the collected edition of *Œuvres de Fénelon*; the voluminous correspondence in that collection; *Vie de Fénelon*, by M. Gosselin; Wunderlich's *F.* (1873); and Hunnius, *Das Leben F.'s* (1873). An English biography, one-sided, but of some value, appeared anonymously 1877.—F.'s half-brother, FRANÇOIS DE SALIGNAC DE LA MOTHE F. (1641-79) was a missionary in Canada among the Cayuga Indians who had left N. Y., and settled on the Bay of Quinté.

FENESTELLA, n. *fĕn'ĕs-tĕl'lä*, or FENESTRELLA [L. a little window]: in *geol.*, an extensive genus of polyzoa or bryozoa resembling the recent lace-coral—so called from the net-like or window-like arrangement of its cells; 30 species are described from the Lower Silurian to the Permian systems. FEN'ESTEL'LIDÆ, n. plu. *-lĭ-dĕ*, the group to which the *fenestella* belong: the polyzoa or lace-corals.

FENESTER, n. *fĕn'ĕs-tĕr*, or FENÊTRE, n. *fĕ-nă'tr* [OF. *fenestré*, having many perforations: F. *fenêtre*, a window—from L. *fenestra*, an opening, a window]: an opening in a building for the admission of air and light; a window. FENESTRATION, n. *fĕn'ĕs-tră'shĭn*, the form and arrangement of windows in a building. FENESTRA, n. *fĕn'ĕs'tră*, in *anat.*, one of two small openings in the bones of the ear. FENES'TRAL, a. *-trăl*, having openings like a window. FENES'TRATE, a. *-trăt*, pierced with holes of considerable size—applied to a leaf with holes in it.

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FENIAN, n. *fē'nī-ān* [Gaelic and Erse, *finz*, a family, a tribe, a clan]: used by Irish Fenians to signify the Irish as a nation *par excellence*; name of a notorious secret and political society among the Irish; a follower of *Fionn* or *Finn*, Fingal, the father of Ossian; applied to the Celtic poetry which celebrates the exploits of Finn and his clansman.—*The Fenians* are a political association of Irish or Irish Americans, the object of which is the overthrow of the English authority in Ireland, and the establishment of a republic. The etymology of the name has been the subject of some discussion. It is traced to the ancient Irish military organization called *Fionna Eirinn*, which took its appellation from the celebrated hero of Irish legend, Finn (or Fionn) MacCumhail. The accounts of this renowned body, with which the bardic literature of Ireland abounds, are most curious. It was designed as a national militia, and its origin is ascribed, by Keating, to Sedna II., monarch of Ireland about B.C. 400. In time of peace it consisted of three bodies, each formed on the model of a Roman legion, and consisting of 3,000 men; but in war, it was capable of being enlarged to any required limit. Candidates for enrolment were required to be of honorable family, to be irreproachable in morals, and to bind themselves to observe the laws of justice and morality; they were required to be of a certain height, and strong, supple, and vigorous of body; each being submitted, before enrolment, to an ordeal, in which his powers of speed, strength, endurance, and courage were tested by trial with his future comrades. The bardic accounts of some of those conditions are extravagant and amusing, but the generally historical character of the institution is unquestionable; and it subsisted until the reign of Carbery, son of Carmac MacArt, by whom the body of Fionna Eirinn was disbanded, and the members having, in consequence, transferred their allegiance to Mucorb, King of Munster, suffered an almost total extermination in the battle of Gavra, A.D. 284, which formed the theme of many a bardic poem from the days of Oisín (known in Gaelic legend as Ossian), son of Finn MacCumhail.

Adopting the name of this ancient military association, the modern Fenians (or Finians) are a secret association for the purpose of overthrowing the alien ascendancy of the Saxon, and of restoring to the ancient Celtic population their legitimate status and influence in their native country. It had its first seat in America, where the Irish population largely increased after the famine of 1846-7. Many of the emigrants being driven from their homes by arbitrary ejection, or from inability to pay rent, carried with them a sense of bitter wrong, which prepared them for almost any enterprise which promised revenge. Others had been sympathizers, if not participators in the insurrection of 1848; and almost all were deeply imbued with general political and social discontent. By all these, the prospect of a secret organization for the establishment of Irish independence was eagerly accepted. The most openly active seat of the organization was in the western states,

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especially Chicago; but the movement was directed from New York, and possessed ramifications in almost every large city of the Union. It was conducted by a senate, and consisted of 'circles,' each directed by a centre. The duty of the centres was to enrol members, who bound themselves, generally by oath, 'to be faithful to the Irish Republic as at present virtually established;' to instruct and practice them in military exercises; to raise funds for the purposes of the association, especially for purchase of arms and munitions of war; and to extend the organization by every means. Agents were sent into Ireland, and to the chief seats of the Irish population in England; and while the work of secret enrolment was industriously carried on in Ireland, measures were openly concerted in America, for raising funds by private contributions, and for purchase of arms and military stores. Opportunely for the enterprise, the termination of the civil war in America set free a large number of military adventurers who had served as privates or as officers in one or other of the American armies, and whose experience of service was turned secretly but actively to account in the training of the young recruits enrolled in the Fenian conspiracy in Ireland. Newspapers, moreover, both in America and in Ireland, were established or subsidized for the purposes of the conspiracy; and journals, broadsides, ballads, and other inflammatory publications were largely circulated among the peasantry and artisans. Taverns, alehouses, and other places of entertainment were ordinary places of meeting; and one of the most formidable of the plans of the conspiracy was an organized attempt to seduce the Irish soldiers in the British army from their allegiance, and to prepare the way for their deserting to the ranks of Fenianism, when it should have reached the expected degree of maturity. It became apparent that in this, unlike almost all similar movements, pains were taken by the organizers to exclude the Rom. Cath. clergy—by whom the Fenian confederation had from the first been steadily resisted—from all knowledge of its character and objects, as well as of the names or number of its members in the several localities; and many of the most active of the leaders were distinguished by the freedom of their religious opinions, and by their unconcealed disregard of clerical authority.

For a time, these designs were carefully concealed, and, even when a certain publicity was given to them, the scheme appeared so wild and impracticable that it was regarded as an attempt, on the part of a body of unprincipled adventurers, to practice upon the patriotic susceptibilities of the ignorant and excitable Irish, especially in America. By degrees, however, the movement acquired more solidity, and the government ascertained that Fenianism, however corrupt in some of its sources, and however wild and extravagant in its aims, was nevertheless a reality with which it had become necessary to grapple. Measures were taken with great promptness and determination. The Habeas Corpus Act having been summarily suspended, all the known leaders in Dublin and in the provincial districts of

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Ireland (most of them Irish-Americans) were at once placed under arrest. The chief journal of the conspiracy was suppressed and seized, additional troops were moved into Ireland, and other measures of repression were vigorously carried out. By these energetic measures, public tranquillity was maintained in Ireland; and, though prosecutions were instituted and a few individual conspirators convicted, so universally was the Fenian movement condemned by the public opinion of the country that most of the prisoners were discharged on condition of their leaving Ireland. But, though thus in appearance extinguished, the embers of discontent continued to smolder among the poorer peasantry and the working population of the towns; and a certain prestige was given to the fallen cause by the escape from prison, under circumstances of much mystery and a high degree of romance, of the most active and crafty of the leaders of the conspiracy. His return, and that of other exiles, to America, renewed the agitation in this country. In the early summer of 1866, a raid was attempted into Canada, and, though it proved so utter a failure as to cover its projectors with ridicule, an organization was secretly pursued, both in America and in Ireland, which resulted, in the spring of 1867, in an insane and utterly abortive attempt at insurrection at home. The plan of the conspirators was to seize the castle and military stores at Chester, and, having cut off telegraphic communication, to convey these arms to Dublin, and effect, throughout the country, a simultaneous rising in concert with the enterprise at Chester. The attempt was defeated though the treachery of one of the conspirators, by whom the plot was revealed. A partial insurrection, however, took place, concurrently with the intended attack on Chester, in the county of Kerry; and a few weeks later, a more extensive movement was attempted in the counties of Dublin, Louth, Tipperary, Limerick, and Cork. But the persons engaged in it were for the most part either American and Irish-American adventurers, or artisans, day-laborers, and mechanics, generally unprovided with arms, and in many cases scarcely beyond the years of boyhood. The only military enterprises undertaken by them consisted in a series of attacks on the barracks of the rural constabulary, in almost every instance unsuccessful; most of the parties dispersed, or were made prisoners after a single night's campaign. The rest betook themselves to the mountains, and after a few days of exposure and hardship, in which they managed to evade pursuit, and carefully avoided all encounter with the military, they were either captured or dispersed. The leaders were tried at a special commission in the spring of 1867, and tranquillity for a time seemed restored in Ireland. Much discontent, however, continued; and as the foreign organization was uncontrolled, and was still maintained, it remained as a standing element of danger and a persisting incentive to domestic disaffection. Considerable alarm was created in England and Scotland by the extent and daring of the organization among the Irish population of the large manufacturing towns. In 1867, Sep., an attack was made, in

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open day, on a police-van in Manchester; the officer in charge was killed, and the prisoners, suspected Fenians, were released. A few weeks later, a still more daring attempt was made to blow down Clerkenwell Prison wall, with the same object. Alarms were circulated of intended burnings in the cities and towns; gunsmiths' shops and even government stores of fire-arms were broken open and pillaged; and a vague but wide-spread feeling of apprehension was for a time created. In 1869, the Fenian Brotherhood was formally chartered in the United States under the act for incorporating benevolent societies. The U. S. government, 1871, frustrated another Fenian raid on Canada by the apprehension of its leaders and the seizure of its arms. At the tenth congress of the brotherhood, 1871, it was reported that in about 12 years above \$626,000 had been raised, of which \$425,000 was expended 'for Irish revolutionary purposes direct.' Gradually the Fenian prisoners whose offense was political merely were released. The disestablishment of the Irish Church, 1869, and the Land Act, 1870, removed some grievances. The action of the Home Rule party (see HOME RULE) was kept within constitutional bounds. In 1879, Oct., the extreme section of the Home Rulers constituted the Land League, which formally insisted on fixity of tenure, fair rents, and free sale (of tenant right); and demanded, publicly but unofficially, the stoppage of all evictions and the abolition of 'landlordism.' The agitation conducted by this body was accompanied by armed intimidation and outrage. Its funds came mainly from America, and were understood to be largely derived from Fenian sources. The *Skirmishing Fund* was promoted by an Irish party in the United States, who advocated the free use of dynamite for the destruction of English public buildings and English commerce. The 'Patriotic Brotherhood' seems to have been one of several societies sprung from the F. Society; and many of the 'Invincibles,' who were to 'make history' by removing tyrants, and were the chief agents in the assassinations of the Irish Secretary and others in 1881 and 1882, had been Fenians. See IRELAND: HOME RULE.

FENN, *fě'n*, HARRY: artist; b. Richmond, England, 1838, Sep. 14. He came to the United States 1856, established himself as an artist and designer on wood, and soon attained wide fame by his book-illustrations. Shortly after the close of the civil war, he travelled extensively through the southern states and made sketches and drawings for a series of articles on *The New South*, for *Appleton's Journal*. Subsequently his travels were renewed through the United States and Canada for the purpose of procuring sketches for *Picturesque America*; and on the completion of that work he visited Europe, Egypt, Palestine, and the Sinaitic peninsula, making sketches for *Picturesque Europe*, and *Picturesque Palestine*. He was a founder of the American Water-color Society.

FENNEC, *fě'n'ěk*, or ZERDA, *zěr'da* (*Megalotis*): genus of *Canidae*, peculiar to Africa, resembling foxes in general

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form and in the bushy tail, but having eyes adapted for diurnal, and not for nocturnal, vision, and remarkably large ears. The species are small and beautiful. They feed partly on dates and other vegetable food; also on eggs, and on insects, which they adroitly snap as they pass.

FENNEL, n. fən'nel [AS. *feonel*; L. *fœnicûlum*, fennel], (*Fœniculum*): genus of umbelliferous plants, allied to Dill (q.v.), but distinguished by the cylindrical, strongly ribbed fruit. The flowers are yellow. All the species are aromatic, and have much-divided leaves with thread-like segments. The best known is the COMMON F. (*F. vulgare*), native of the s. of Europe and parts of England, and abundant in parts of the United States. It is a biennial, three or four ft. high, cultivated in gardens chiefly for its leaves, which are boiled and served up with mackerel, with salmon, and occasionally with other kinds of fish, or are used to form a sauce for them.—SWEET F., ITALIAN F., or CRETAN F. (*F. dulce*), is a more tender plant, of much humbler growth, and annual, much cultivated in the s. of Europe; by some it is regarded as the same with the Common F. The young sprouts from the root are sweeter and less aromatic than those of Common F., and, when



Fennel (*Fœniculum vulgare*):
a, a flower.

blanched, are a very agreeable salad and pot-herb. The fruit (seed) is longer and paler than that of Common F., has a more agreeable odor and flavor, is the favorite aromatic condiment of the Italians, and is used in medicine as a carminative and aromatic stimulant. The seeds of a species of F. are occasionally called caraway-seeds, though with doubtful correctness. *Oil of F.*, an aromatic, stimulant, and carminative essential oil, also is made from it.—CAPE

FENNY—FENUGREEK.

F. (*F. Capense*), found in the interior of the Cape of Good Hope, has a thick, aromatic, esculent root.—The **PANMUHOOREE** of India (*F. panmorium*) is a species of **F.** much cultivated in its native country for its sweet, warm, and aromatic fruit, which is used as a carminative and in curries.—The **GIANT F.** of the s. of Europe is a plant of a different genus (*Ferula*), and abounds in a fetid juice. It is indeed closely allied to asafœtida, but forms a favorite food of buffaloes in Apulia, where it abounds. The dry dead stem is full of a white pith, used in Sicily as tinder.

FENNY: see under **FEN**.

FENRIR: see **SCANDINAVIAN MYTHOLOGY**.

FENT, n. *fěnt* [*F. fente*, a slit]: the opening left in an article of dress (as in the sleeve of a shirt, the skirt of a gown), for convenience in putting it on; a placket.

FENUGREEK, n. *fěn'û-grěk* [*L. fœnum*, hay: *Græcum*, Greek—*lit.*, Greek hay], (*Trigonella*): genus of plants of nat. ord. *Papilionaceæ*, sub-order *Leguminosæ*, allied to clover and melilot. The plants are small and creeping, with pink or white flowers. The leaves have three obovate leaflets and scythe-shaped stipules. The flowers generally have the *keel* very small, so that the *wings* and *standard* present the appearance of a tripetalous corolla. The **COMMON F.** (*T. fœnum Græcum*) is a native of the s. of Europe



Fenugreek (*Trigonella fœnum Græcum*).

and of parts of Asia; it is much cultivated in India as a fodder-plant, and derives its name (*Fœnum Græcum*, Greek hay) from its use as fodder in Greece. Its pods are many-

FENWICK—FEOFF.

seeded and cylindrical; its seeds have a strong, peculiar smell, and an oily, bitter taste; the flour made from them is used for emollient poultices, but only in veterinary practice. The seeds of *F.* were formerly in great esteem in medicine.—Another species (*T. incisum*), growing spontaneously in many parts of India, is much used as fodder for cattle. The legumes of the ESCULENT TRIGONELLA (*T. esculenta*), also an Indian plant, are used as human food.

FENWICK, fən'wĭk, GEORGE: colonization agent of Lords Say and Brook. He came to America, 1636, to take charge of the Saybrook Plantation, in Conn., and, after a short visit to England, governed and superintended the colony, 1639–44; when he sold the plantation to the Conn. Colony, and returned to England. He was a col. in the parliamentary army, a judge at the trial of Charles I., and died 1657.

FENWICK, JOHN: 1618–83; b. England: colonist. He was a Quaker; obtained a grant of land in w. N. J. 1673; founded a colony at Salem 1675; was imprisoned by Gov. Andros, who disputed his proprietorship 1678–81; transferred his claim to William Penn; and died poor.

FENYES, fən-yĕsh, ELEK (Alexius): Hungarian geographer and statistical author: b., 1807, at Csokaj, county of Bihar. He became barrister-at-law, 1829, but began travelling over the country to gain acquaintance with the state of the Hungarian kingdom, of which there had never been an authentic survey. His first work appeared 1840, *Hungary and Its Annexed Parts, Geographically and Statistically Considered* (6 vols. Pesth), and secured the great prize of 200 ducats from the Hungarian Academy. *The Statistics of Hungary*, 3 vols., followed (1843); *General Atlas for Hungary* (1845); *Description of Hungary* (1847); *Geographical Dictionary of Hungary* (1851)—all published at Pesth. All F.'s works are in the Magyar tongue, but several have been translated into German and repeatedly published. They are the first true presentations of the state of Hungary; and, for completeness, solidity, and exactness, they will bear comparison with the best works in their department in European literature. During the national government of Hungary (1848), F. was chief of the statistical section. Many years ago, F.'s health failed and he retired into private life.

FEOD, fūd: see under FEUDAL.

FEODO'SIA, or THEODO'SIA: see KAFFA.

FEOFF, n. fĕf [Norm. *F. feoffer*, to invest with a fief—from *fief*, a fief]: another spelling of FIEF (q.v.). **FEOFFMENT, n. fĕf mĕnt**, act of granting possession. **FEOFFTEE, n. fĕf-fē'**, the person who receives or holds a feoff. **FEOFFER, or -FOR, n. fĕr**, the granter of a feoff.—*Feoffment* is the oldest, and long was the only, method for the conveyance of land known in England. Feoffment consisted in the formal conveyance of the land from the feoffer to the feoffee, the former stating distinctly the measure of the estate conferred, whether it was in fee, in tail, or for life. Where no mention of the duration of the estate was made, the gift

FERÆ—FERÆ NATURÆ.

was presumed to be for life. This conveyance of the land, in order to be complete, required to be accompanied by delivery of sasine (q.v.). Livery of sasine was of two kinds, viz., by deed, and in law. In the former case, the parties being actually upon the land, the feoffor, by delivery of a twig or a turf, testified his conveyance of the land. In livery in law, the parties being in sight of the land, the feoffor referring to the land gave possession to the feoffee. This mode of feoffment was ineffectual unless the feoffee entered into possession during the life of the feoffor. Livery in deed might be effected by attorney; but livery in law only by the parties themselves. In the earliest times these ceremonies completed the conveyance. But by degrees the practice of embodying the transaction in a deed was introduced. When a deed was used, it became customary, but not essential, to indorse on the deed the fact that livery of sasine had been made. By later laws a feoffment is void unless accompanied by deed, and the formerly possible 'tortious conveyance' was ruled out. It must be observed that the practice of feoffment above described, and which has existed in England from time immemorial, differed materially from the old form of investiture in use in strictly feudal times, and from that which still prevails in Scotland. In England, the transaction was simply a conveyance by the actual holder of the land to a new tenant, testified by certain ceremonies, but requiring no confirmation by a third party to complete it. But by feudal usages every holder of land was the vassal of some superior lord, to whom he owed suit and service, and without whose consent he could not even part with his land; hence no conveyance was complete without the reception of the new tenant by the lord paramount as his vassal. In like manner, to this day, in Scotland, no transfer of heritage is complete without the formal confirmation of the superior, though by recent legislation the old feudal usages have been abolished. See INFESTMENT: SASINE: FEUDAL SYSTEM.

Feoffment to Uses.—A former application of the feudal form of *feoffment* in England in order to effect a conveyance in trust. The common-law courts, adhering to feudal rules, refused to recognize any interest in the land but that of the person actually infest; but where a feoffment was made to one man to the use of another, the equity courts gave effect to the transaction by compelling the party infest to hold in trust for the third person, called the *cestui que use*: see USES.

FERÆ [Lat. *ferus*, wild]: in the Linnæan system of zoology, an order of *Mammalia*, nearly corresponding to the *Carnaria* (q.v.) of Cuvier.

FERÆ NATURÆ [Lat. of a wild nature]: term in Roman law for animals which flee the dominion of man, whether beast, bird, or fish, and retain their natural freedom. According to that system, such animals became the property of any one who might catch them, irrespectively of the ownership of the soil on which they were taken, on the principle

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that 'natural reason gives to the first occupant that which has no owner.'—*Inst.* ii. tit. i. s. 12. But this regulation did not prevent the prohibition of trespass. 'Of course, any one who enters the ground of another for the purpose of hunting or fowling may be prohibited by the proprietor, if he perceives his intention of entering' (*Ib.*). This right on the part of the proprietor did not affect the property of the animal taken, though it gave him an action against the trespasser. If a wild animal escaped from its captor, his proprietorship instantly ceased, and the animal might again be appropriated by its captor. This occurred even though the animal was not out of sight, if it could not be pursued without great difficulty. Even a wounded animal was not the property of the sportsman till it was caught, though the point which is decided in this sense (*Inst.* ii. tit. i. s. 13) is said to have been one on which difference of opinion had prevailed. Except so far as modified by the statutes (see GAME-LAWS), these provisions form part of the common law. Under *feræ naturæ*, the law of Rome included *bees*, unless included in a hive, or unless the proprietor be in pursuit of them, and has kept them in sight: see BEE. Domestic animals, though they stray, do not cease to be the property of those to whom they have belonged; but as regards animals which have a tendency to return to a state of nature, the rule of the Roman law was, that property in them continued so long as they had the intention of returning (*animus revertendi*), or rather, the habit of doing so. This rule applied to peacocks and pigeons, but not to fowls and geese; fowls and geese, though frightened and in flight, were still private property, so that whoever detained them with a view to his own profit, was guilty of theft. See DOVECOT: WARREN: FOREST LAWS: FISHES, ROYAL.

FERAL: see under **FERINE**.

FER DE LANCE, *fër-dê-lângs*: exceedingly venomous serpent, found in the sugar plantations of Brazil and the W. Indian Islands, dreaded alike by man and beast. It often attains a length of 8 ft., gives no warning of its intended attack, and its bite is usually fatal. It belongs to the rattlesnake family, its tail terminates in a horny spike, and when in pursuit of prey it springs to a great distance.

FERDINAND, *fër'dî-nând*, Ger. *fër'dê-nânt*, I., Emperor of Germany: 1503-64 (reigned 1556-64); b. Spain; son of Philip I., and brother of Charles V. whom he succeeded in the empire 1556, having been previously elected king of Rome. F. had married, 1521, Anna, daughter of Ladislaus VI., King of Bohemia and Hungary. When her brother Louis fell in battle with the Turks 1526, leaving no issue, the crown was claimed by F. in right of his wife. This involved him in a long and bloody struggle with a rival, John of Zapolya, who laid claim to Hungary, and who, as well as his son Sigismund, was supported by Soliman, Sultan of the Turks. F. at last gained the upper hand, bought off the Turks by a yearly tribute, and finally secured Hungary and Bohemia to the House of Austria. When he was elected emperor, the concessions that he had

FERDINAND II.

made to the Protestants caused the pope, Paul IV., to refuse to acknowledge him. The pope's successor, Pius IV., was more complaisant; but the electors resolved that for the future the consent of the pope should not be asked, and this was carried out. F. made several attempts to reconcile the Protestants and Rom. Catholics, and urged on the Council of Trent, though fruitlessly, the reformation of abuses. He left the reputation of a prudent and enlightened ruler, and was succeeded by his son, Maximilian II.

FERDINAND II., Emperor of Germany: 1578, July 9—1637, Feb. 15 (reigned 1619–37); b. Gratz; grandson of Ferdinand I.; and son of Charles, Archduke of Styria, younger brother of Maximilian. F.'s mother, Maria of Bavaria, early inspired him with hatred against the Protestants. He was educated by the Jesuits at Ingolstadt, with Maximilian of Bavaria; and at Loretto, he had taken a solemn oath, before the altar of the Mother of God, to reinstate Rom. Catholicism as the sole religion of his dominions, at any cost. As soon as he succeeded to the government of his own duchy of Styria, he set about putting down Protestantism by force. He attempted the same in Bohemia and Hungary, of which countries he had been elected king during the lifetime of Matthias Corvinus; but though at first unsuccessful, and even in danger of losing his dominions, he ultimately managed, with the aid of the Rom. Catholic league and of Elector George I. of Saxony, to subdue them. Bohemia lost all its privileges. By hanging, confiscation of property, and the banishment of innumerable families, the wretched land was reduced to obedience; and the introduction of the Jesuits, and rigorous persecution of Protestants, re-established Rom. Catholicism. Meanwhile, F. had been elected emperor of Germany (1619). The war, which properly ended with the subjugation of Bohemia, was at the same time transferred to the rest of Germany, and took the character of a religious war—the famous 'Thirty Years' War' (q.v.). The two imperial generals Tilly and Wallenstein, were opposed by a confederacy of the Prot. states of Lower Saxony, with Christian IV. of Denmark at their head; but the confederates were defeated by Tilly at the battle of Lutter, in Brunswick, and forced to conclude peace (Lubeck 1629). Confident in the ascendancy which he had acquired, F., in the same year, issued an Edict of Restitution for the whole of Germany, taking away from the Protestants nearly all the rights that they had acquired by a century of struggles; and the troops of Wallenstein and of the league were immediately set to work to carry it out in several places. But further proceedings were soon arrested by the dismissal of Wallenstein, on which the diet of the empire at Regensburg had insisted; and by the opposition of Richelieu, who put every wheel in movement to curb the power of the House of Austria. At this time also, a formidable opponent to the schemes of the emperor appeared in the person of Gustavus Adolphus of Sweden (q.v.). After the murder of

FERDINAND III.—FERDINAND I.

Wallenstein, the connivance at which is an ineffaceable blot on F.'s memory, the imperial commander, Gallas, gained the battle of Nordlingen 1634, which had the effect of detaching Saxony from the Swedish alliance; but the ability of the Swedish generals, for whom Austria had none that were a match, and the open part that France now took in the contest, brought back the balance of victory so far to the Prot. arms, that when F. died, he had given up the hope of ever attaining his objects. His reign is one of the most disastrous in history; for Germany owes him nothing but bloodshed, and misery, and desolation.

FERDINAND III., Emperor of Germany: 1608, July 11—1657, Apr. 2 (reigned 1637-57); son of Ferdinand II. He was not so much under Jesuitical and Spanish influence as his father. Having accompanied the armies in their campaigns after the death of Wallenstein, he had witnessed the miseries of war, and was inclined to peace; but the conflicting interests of the individual belligerents hindered any unity of view, and made it necessary to proceed with the contest. Thus was this miserable war protracted, ever extending in circuit, and increasing in devastation owing to the growing licentiousness of the soldiery. At last, 1643, a congress met at Münster to arrange terms of peace, which was concluded 1648, known as the Peace of Westphalia. At the diet of the empire, 1653-4, the last presided over by an emperor in person, F. effected important alterations in the administration of justice. He died shortly after concluding an alliance with Poland against Sweden. His son, Leopold I., succeeded him in the German empire.

FERDINAND I., Emperor of Austria: 1793, Apr. 19—1875, June 29 (reigned 1835-48); b. Vienna; eldest son of Francis I. by his second marriage with Maria Theresa of the House of Naples. He was from the first of a weak constitution, and was unfortunate in those to whom his education was intrusted. Yet he showed on all occasions a goodness of heart, which was fostered by the example of his uncle, the Archduke Charles, to whom he was much attached. While crown-prince, he travelled through his Italian provinces, Switzerland, and part of France, and took great interest in manufacturing industry. In 1835, he succeeded his father on the throne. It was expected from his character that he would inaugurate a more liberal policy than his predecessors had pursued, but the absolutist principles that seemed destined to rule for ever the Austrian cabinet, triumphed, and Metternich was allowed to carry on the government. It now became obvious that F. sadly lacked moral decision, and his 'goodness' exhausted itself in numerous acts of clemency and benevolence. Nevertheless, during his reign, the industry of Austria made great advance, and the great network of railroads and highways was begun. The insurrection in Galicia 1846, led to the annexation of Cracow to Austria. No country was more affected by the European movement that began in the winter of 1847-8 than Austria, though the revolutionary storms that shook the empire cannot be attributed to any want of

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good-will to his people on the part of F., but only to a complete lack of political wisdom. On the disturbances breaking out in March, he consented to the dismissal of Metternich, the appointment of a responsible ministry, and granted the outlines of a constitution. In May, he retired with his court to Innsbruck, but was induced to return to the capital in August. At last, the October insurrection in Vienna caused him again to leave the palace of Schönbrunn, and retire to Olmütz, where, 1848, Dec. 2, he abdicated in favor of his nephew, Franz Joseph. He afterward resided at Prague, where he died. He married, 1831, Feb. 27, Caroline, daughter of Victor-Emmanuel I., King of Sardinia, but had no children.

FERDINAND I. (THE JUST), King of Aragon and Sicily: 1379-1416 (reigned 1412-16); younger son of John I. of Castile and Leonora of Aragon. In 1406 he refused the crown of Castile when offered by the nobles on the death of his brother Henry III., but accepted the regency as his brother had desired during the minority of John II., his nephew. He obtained signal victories over the Moors with his army and navy, and directed the domestic affairs of the kingdom with a liberal and prudent hand. When Martin, King of Aragon and Sicily, his uncle on his mother's side, died, he was brought forward as a candidate for the throne, and supported with much zeal by a strong party in the state, though he had no claims under the laws of descent. The manifestation in his favor became so strong that the question of succession was referred to a body of 9 judges, representing Catalonia, Valencia, and Aragon, and he was elected 1412. He deferred his coronation till after he had subjugated his rivals, and on the defeat of Count Jayme of Urgel at Balaguer, his last opponent, the ceremony was performed at Saragossa 1414. In the same year he was a staunch supporter of the claims of the Spaniard, Benedict XIII. (Peter de Luna), at the council of Constance, when the papal schism was at its height, and three rival popes were claiming the obedience of the faithful. In the following year John XXIII. was deposed and Gregory XII. abdicated. These events prepared the way for peace, and F., anxious to have the unity of the church restored, took part in a conference between Sigismund and representatives of France, Castile, and Navarre, and renounced obedience to the Spanish papal claimant. F. was succeeded by his son Alphonso V., known as the conqueror of Naples.

FERDINAND II., King of Aragon and Sicily: see FERDINAND V. (THE CATHOLIC), of Castile.

FERDINAND I., King of Naples: 1423-94 (reigned 1458-94); illegitimate son of Alphonso V. On the death of his father, who had ruled Naples, Sicily, Aragon, and Sardinia, he received the throne of Naples 1458, and entered upon a troublesome reign. Many of the most powerful nobles conspired to aid John of Anjou in seizing the country. John invaded the kingdom and defeated F. at Nola 1460, from which F. fled to his capital with but

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20 followers. In his dire extremity Pope Pius II., the Duke of Milan, and the Albanian chief Scanderbeg, came to his relief, and the latter, assuming command of the army, defeated John at Troja and forced him from Italy 1462. In 1480 the Turks descended upon Italy and took Otranto, but F. recovered the city the next year. The nobles again revolted 1485, when he appeased them with promises that he afterward broke: he was excommunicated by Pope Innocent VIII. 1489, but regained his favor 1492; and died while the expedition of Charles VIII. of France was on its way to invade Italy.

FERDINAND III., King of Naples: see FERDINAND V. (THE CATHOLIC), of Castile.

FERDINAND I. (THE GREAT), first king of independent Castile: 1000–1065, Dec. 27 (reigned 1033–65); second son of Sancho el Mayor, King of Navarre. In 1026 his father compelled Bermudo III., King of Leon, to surrender his rights over Castile, and to give his sister Dona Sancha in marriage to F., then regent of that province. The marriage was consummated and F. received the title of king of Castile 1033. Sancho died 1035, after dividing his possessions among his four sons, giving to F. Castile, which was henceforth recognized as an independent sovereignty. Shortly after the death of Sancho, Bermudo attempted to recover his lost possessions, but was defeated and slain by F. in the battle at Lantada near Rio Carrion 1038. F. then claimed and received the crown of Leon, in right of his queen, and entered upon a conciliatory and equitable reign which soon won for him the esteem and support of his new subjects. He gained a considerable portion of Portugal by invasion and conquest 1045; extended the Christian frontier from the Douro to the Mondego and reduced to vassalage the emirs of Toledo, Saragossa, and Seville, by his wars against the Moors 1046–49; and secured a large portion of territory belonging to Navarre and made himself the most powerful among the Christian princes in the peninsula by defeating his brother, Garcia III., King of Navarre, who had invaded his possessions, in a battle at Atapuerca near Burgos, 1053. About 1055 F. assumed the title of emperor, with a view of indicating his supremacy in Spain; but the act was held by the emperor Henry III. to be an infringement of his own rights of suzerainty, and his complaint was sustained by Pope Victor II. Subsequently a decision was given favoring F.'s imperial claims so far as they covered the territory that he had wrested from the Moors. In 1063 he forced the emir of Seville to restore to him the relics of St. Isidro; and in 1065, while on an expedition against Valencia, he was seized with a mortal sickness, and returning to his capital, Leon, divided his possessions among his three sons, and spent his last days in rigid devotional exercises.

FERDINAND II., King of Leon: 1136–88 (reigned 1157–88); younger son of Alphonso VIII. On the death of his father he received the kingdom of Leon, that of Castile having been bequeathed to his brother Sancho III. In

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1158 his possessions were invaded by Sancho, who took advantage of a rupture between F. and his most powerful nobles, and F. was forced into submission to his brother. Sancho died shortly afterward and then F. took possession of Castile under the pretense of guarding the interests of his nephew Alphonso III. thereby, and held it till Alphonso's marriage with Leonora, daughter of Henry II. of England, 1170. F. became involved in a war with his father-in-law, Alphonso I. of Portugal, by repudiating his wife, and defeated and captured him at Badajoz 1169. He waged war successfully against the Moors, and instituted the military order of Alcantara.

FERDINAND III. (SAINT), King of Castile and Leon: 1200–52 (reigned 1217–52); son of Alphonso IX. of Leon, and of Berenguela, sister of Henry I. of Castile. His uncle died without issue 1217, and through his mother's influence the title of Blanche, the elder of the surviving sisters, was set aside, and the crown given to F. By wise administration he gained the support of the chief towns and the most powerful nobles, and (1225) began a career of conquest which effectually broke the Moorish power in Spain. His father died 1230, and in his will declared his marriage with Berenguela void, and designated his two daughters by his first marriage his successors. F. interrupted his Moham-medan crusade long enough to insure his own inheritance and thus permanently united the kingdoms of Castile and Leon under one crown. Resuming his military operations he conquered Ubeda 1234, Cordova 1226, Jaen 1245, and Seville 1248, the latter surrendering Nov. 23, after a siege of nearly two years. While planning an invasion of Africa, he died in Seville 1252, May 30, bequeathing his kingdom to his eldest son Alphonso X. F. was distinguished as much for religious zeal as for military prowess. He was an uncompromising enemy of the Jews and Albigenses, who had sought asylum in his possessions; founded the Univ. of Salamanca, 1243, which his son nobly fostered; had the code of Visigothic laws translated into the vulgar tongue; was popularly known as *el Santo* from an early age because of his devotion to the Rom. Cath. Church; and was canonized by Pope Clement X. 1671, his day in the Spanish calendar being that of his death.

FERDINAND IV., King of Castile and Leon: 1285–1312 (reigned 1295–1312); son of Sancho IV. He succeeded his father when 10 years old, and at once had his possessions contested by his uncle Enrique who was anxious to become regent, by Don Juan Nunez de Lara who wanted to enlarge his estates, and by his cousins the infantes of La Cerda, who first claimed the crown and then aspired to a division of the kingdom. Through the shrewdness of his mother, Maria de Molina, these several schemes were frustrated. The king of Portugal was conciliated and gave his daughter Constanza in marriage to F., and an alliance was effected with the king of Aragon. As soon as F. was secure in the possession of his throne, he resumed the policy of war against the Moors, and was pecuniarily aided by

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Pope Clement V. and his own nobles. He took Gibraltar 1309, and on the extinction of the order of Templars by the Pope 1310, confiscated their property and shared it with other orders of chivalry. He died suddenly at Jaen, 1312, Sep. 7, and was succeeded by his infant son, Alphonso XI.

FERDINAND THE CATHOLIC, King of Spain—V. of Castile, II. of Aragon, III. of Naples, II. of Sicily: 1452. Mar. 10—1516, Jan. 23 (reigned 1474–1516); son of John II., King of Navarre and Aragon. In 1469 he married at Valladolid, Isabella, sister of Henry IV. of Castile. Even in the lifetime of his father, events were paving the way for the union of the two kingdoms of Castile and Aragon. On the death of Henry IV. of Castile, 1474, the cortes refused to acknowledge the legitimacy of his daughter Juana, and proclaimed Isabella and her husband F. joint-sovereigns. A war ensued, in which they were completely successful. In 1479, F. becoming king of Aragon on the death of his father, the two kingdoms of Aragon and Castile were united in the persons of F. and Isabella. Isabella, however, as long as she lived, maintained her position as queen of Castile, and allowed her husband no other share in the government than the privilege of affixing his signature to the decrees, and of uniting his arms with her own. F.'s whole reign was an uninterrupted series of successful wars. In Castile, he distinguished himself by the effectual suppression of the banditti, who had become formidable in the confusion resulting from the civil wars. This he accomplished by re-organizing and putting in force against them the *hermandad*, or brotherhood, a kind of Spanish militia, composed of the citizens and the country-people. But F., whose craft and vigor were quite Machiavelian, was not content with taking strong measures against the Castilian outlaws; he resolved also to break the power of the feudal nobility, and made good use of the *hermandad* in carrying out this design. Cities and towns were encouraged to make themselves independent of the nobles, who were deprived of many important privileges, and among other humiliations, were subjected to the ordinary tribunals of justice. The establishment of the Inquisition 1478–80, though primarily and mainly intended to further 'religious' ends, likewise helped to lessen their influence. F. strengthened his power also by vesting in himself and his successors the grand-mastership of the military orders of Calatrava, Alcantara, and Santiago. In all his schemes, F. was ably seconded by his queen Isabella, and by the celebrated Cardinal Ximenes. The year 1492 was the most brilliant in his reign, and is one of the most important in the history of the material progress of the world. It was signalized by the discovery of America by Christopher Columbus, though the honor of having aided the great navigator belongs not to F. but to Isabella. The same year witnessed the capture of Granada, and the retreat of the last Moorish monarch into Africa. F., who had a true Spanish hatred of heresy, immediately issued an order for the expulsion of the Jews from the conquered kingdom; and, in consequence, 160,000—some say 800,000—of his new subjects

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were compelled to scatter themselves over Europe. This act, neither wise nor Christian, was in accordance with the religious barbarism of the age, and especially of Spain. It was followed, several years afterward by the persecution and expulsion of the Moors—an act still more unwise than the former, for the Moors of Granada were unquestionably the most industrious, civilized, and refined inhabitants of the peninsula. F. was as successful abroad as at home. He was victorious over Alfonso V., King of Portugal; while his general, Gonzalvo de Cordova, twice wrested Naples from the French—the second time in 1503—after which it remained permanently in F.'s possession. In the following year, Isabella died; and in 1505, he married Germaine de Foix, niece of Louis XII. of France. He took part in the famous league of Cambrai against Venice 1508; made himself master of various towns and fortresses in Africa; and, 1512, conquered the kingdom of Navarre; thus becoming monarch of Spain from the Pyrenees to the Rock of Gibraltar. He died at Madrigalejo, and was succeeded by his grandson, Charles V. To F. and Isabella Spain owes her unity and greatness as a nation; and, in the no less skilful hands of their successor, she exercised an imperial influence over Europe, which it required Luther and the Reformation to check. See Prescott's *History of the Reign of Ferdinand and Isabella of Spain* (1838).

FERDINAND VI. (THE SAGE), King of Spain: 1713–1759, Aug. 10 (reigned 1746–59; son of Philip V. and Louisa Maria of Savoy. He was proclaimed prince of the Asturias on the death of his elder brother Louis, 1725; was betrothed to Barbara, daughter of John V. of Portugal, 1729; and succeeded his father 1746, July 9. His main efforts after ascending the throne were to secure peace for his country, which had been exhausted by wars with England and Austria, and within a month he ordered the withdrawal of the Spanish troops from Italy, and began negotiations with England which resulted in the treaty of Aix-la-Chapelle and the restoration of peace to Europe 1748, Oct. He then gave great encouragement to manufactures, arts, and literature, improved the army and navy, reformed many abuses of ecclesiastical patronage, and, becoming weak in health and despondent in temperament, gradually relinquished the active control of state affairs to the queen, his ministers, and the tenor Farinelli (q.v.), whose singing had a remarkably soothing influence over him, and who thereby, became very powerful at court. At the outbreak of the seven years' war 1756 he maintained a strict neutrality, though offered Minorca by France and Gibraltar by England for his assistance. His queen died 1758, and he immediately fell into a deep melancholy which resulted in insanity and his death at Villaviciosa. As he left no issue, he was succeeded by his half-brother Charles III., according to the terms of the Aix-la-Chapelle treaty.

FERDINAND VII., King of Spain 1784, Oct. 14—1833, Sep. 29 (reigned 1814–33); son of Charles IV. and

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the princess Maria Louisa of Parma. Although he had the advantage of excellent preceptors, especially the Canon Escoiquiz, in his youth, yet the machinations of the notorious Godoy, minister of Spain, precluded his opportunity for the intelligent exercise of his faculties. A deliberate attempt was made by his mother and Godoy to degrade him into a lover of mere animal pleasures, that their influence and authority might be unrestrained. F. soon conceived an aversion to the minister, which was increased by his marriage in 1802 with the amiable and accomplished Maria Antonietta Theresa, daughter of Ferdinand I., King of the Two Sicilies. This lady, who endeavored to maintain her husband's dignity, died, 1806, May 21, of grief, as is supposed, at the insults offered to her by Godoy, the king himself, and above all by the queen. Suspicions of foul play, however, were entertained by Ferdinand. Mainly for the purpose of gratifying their hatred of Godoy, a number of the nobles, headed by the Duke of Infantado, assembled round F., the crown-prince. A false step that the latter now took proved the beginning of great misery to Spain. By the advice of the Canon Escoiquiz, he wrote a letter to Napoleon, in which he expressed a wish to marry the eldest daughter of Lucien Bonaparte. This letter fell into the hands of the minister himself, and the prince was in consequence arrested in the Escorial, 1807, Oct. 28, and declared a traitor by a royal proclamation, written in Godoy's own hand, and addressed to the Council of Castile. The animosity of the people toward the minister led to the revolution of Aranjuez, and the king abdicated in favor of F., 1808, Mar. 19. Almost immediately however, Charles wrote to Napoleon, declaring his abdication to be forced. Napoleon, who had designs of his own upon Spain, refused to recognize F. as king, but sent him an invitation to meet him at Bayonne. In spite of all warnings to the contrary, F. repaired to Bayonne, at which place he arrived Apr. 20, and was received with distinction by Napoleon. Meanwhile, however, the French troops under Murat had marched across the Pyrenees, and taken possession of the Spanish capital. The wretched squabbles and recriminations that followed between Charles and his son, and which were encouraged by Napoleon, ended in F.'s renouncing the crown of Spain unconditionally, receiving for himself and his posterity an annual income of 600,000 francs from the crown revenues of France, likewise the palace and parks of Navarre. The château of Valençay, belonging to Prince Talleyrand, was assigned as a residence, to him, with his brother Don Carlos, his uncle Don Antonio, the Canon Escoiquiz, and the Duke of San Carlos. Here his proceedings were watched with the utmost vigilance; and it was not till the end of 1813, when the splendid series of British triumphs in the peninsula had made a longer occupation of the country by the French impossible, that Napoleon offered to reinstate him on the throne of Spain. On Mar. 14 F. returned to Spain, where he was received with every demonstration of loyalty and affection. Very unfortunately

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for Spain and for his own comfort, F. had, in the meantime, learned to associate liberalism with Jacobinism, and both with Bonapartism, so that, on his reaccession to power, he threw himself into the hands of the clergy and the reactionary portion of his nobility. Even before his arrival in Madrid, he refused to swear or accede to the constitution of the cortes, as interfering too much with the free exercise of regal authority, though he promised another in its place. From the moment, however, that he assumed the reins of government, a series of transactions took place which excited the astonishment and disgust of all liberal-minded politicians in Europe. Instead of the promised constitution, there commenced a fearful system of persecution against all suspected of liberal opinions; and executions, imprisonment, exile, and confiscation of property reigned in all parts of the kingdom. The monastic orders, the Inquisition, and the rack were restored, and every expression of opinion rigorously repressed. It is estimated that 20,000 families were compelled to leave their country. At length, 1820, Jan., an insurrection broke out, and F. was compelled to restore the constitution of the cortes of 1812; but the French government interfering by force of arms, absolutism was restored in Spain 1823. In 1820, F. married the notorious Maria Christina—his *fourth* spouse. By the first three, he had no children. Maria, however, bore him two children: Isabella II., the late queen of Spain, and the Infanta Maria Louisa, who married the Duke of Montpensier. By the influence of Maria Christina, F. was induced to abrogate the Salique law excluding females from the throne, and to restore the old Castilian law of cognate succession. This step led to a dangerous combination among the adherents of the king's brother, Don Carlos, even during the lifetime of the former, and after his death, to a civil war: see DON CARLOS: ESPARTERO: ETC. 1833, June 20, the deputies, cortes, and grandees of the kingdom, took the oath of fealty, and did homage to the Princess of the Asturias, and F. died Sep. 29. F.'s reign was disastrous to his country. He has been described as the typical Spanish Bourbon—selfish, hypocritical, dissolute, ferocious, imbecile, and religiously savage.

FER'DINAND, *fēr'dī-nānd*, I. (EL GENTIL, The Gentleman), King of Portugal: 1345–1383, Oct. 22 (reigned 1367–83); son of Pedro I. of Portugal. He succeeded his father 1367, and two years later on the death of Pedro the Cruel of Castile, claimed the vacant throne as great-grandson of Sancho IV., on the maternal side. The kings of Aragon and Navarre also became claimants, and while the three disputed Henry of Trastamara boldly seized the crown and took the field at the head of the army. The rivals engaged in several indecisive campaigns, and then agreed to submit their respective claims to Pope Gregory XI. A treaty was ratified 1371 which provided for the marriage of F. and Leonora of Castile, but the former fell in love with the wife of one of his courtiers, Leonora Tellez, procured a dissolution of her marriage and made her his queen. This action led to an in-

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surrection in Portugal and incited the Duke of Lancaster to prevail on F. to make a secret treaty for the expulsion of Henry from his throne. An unsuccessful war followed, and peace was negotiated 1373. Six years afterward Henry died, and the Duke of Lancaster reasserted his claims to the throne and was sustained by Portugal. F. signed a treaty of peace at Badajoz 1382, in which it was agreed that his heiress Beatrix should marry John, King of Castile, with the ultimate view of uniting the two crowns. He died at Lisbon without male issue, and the direct Burgundian line which had occupied the throne since about 1112 became extinct. After his death the agreements regarding the succession in the treaty of Badajoz were set aside and F.'s illegitimate brother, John, grandmaster of the order of Aviz, was proclaimed king. This defection led to a war of several years' duration.

FERDINAND (AUGUSTUS FRANCIS ANTHONY): titular King of Portugal (1837-53), regent (1853-55); b. 1816, Oct. 29; son of Prince F. of Saxe-Coburg-Gotha. He married the widowed Queen Maria II. of Portugal, 1836 and received the courtesy title of king 1837, Sep. 16. The queen died 1853, Nov. 15, and he became regent of the kingdom during the minority of their eldest son, the late Pedro V., which terminated 1855, Sep. 16. He is a man of wide scholarly and artistic attainments, an accomplished musician and composer, and a skilful painter and engraver. In 1869, June, he married Eliza Hensler, of Boston, Mass. (dau. of a German shoemaker formerly resident in Springfield, Mass.), a remarkably beautiful woman and a charming opera singer, for whom he obtained the title of Countess of Edla, and made his permanent home in Lisbon. He was offered the crown of Spain by marshals Prim and Serrano 1870, but declined it. F.'s second son, Louis I., succeeded to the throne 1861, Nov. 11; died 1889, Oct. 19; and was succeeded by his son, Carlos I.

FERDINAND I., King of the Two Sicilies: 1751, Jan. 12—1825, Jan. 4 (reigned 1759-1825, with interregnum 1806-15); son of Charles III. of Spain. When Charles ascended the Spanish throne, 1759, F., though a minor, succeeded him on that of Naples under a regency. After his marriage, 1768, with Maria Carolina, daughter of Empress Maria Theresa, he fell completely under her influence, and lost all his former popularity. The queen and her favorite minister Acton (q.v.) ruled the kingdom. F. joined England and Austria against France 1793, but 1801 was forced to enter into a treaty with the First Consul. A subsequent violation of this treaty compelled him, 1806, to take refuge in Sicily, under the protection of the English. A French army marched into Naples, and took possession of the kingdom, which Napoleon bestowed first on his brother Joseph, and afterward on Murat. F. was reinstated by the congress of Vienna, and entered Naples, after Murat's flight, 1815, June. His queen had died 1814. During the revolution of 1820, he was obliged to introduce the Spanish constitution of 1812, but abolished it next year

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with the help of Austrian arms. He, however, expelled the Jesuits, and abolished superfluous convents; acts that may, perhaps, partly atone for his bloody persecution of the republicans 1800, and his general antipathy to enlightened principles of government. He was succeeded by his son Francis I., who died 1830.

FERDINAND II., King of the Two Sicilies: 1810, Jan. 12—1859, May 22 (reigned 1830–59); son of Francis I. by his second wife, Isabella Maria of Spain. The country was in most wretched condition; and all eyes were turned to the young king, the beginning of whose reign was marked by various acts of clemency toward political enemies, and by the introduction of reforms in the economy and government of the country. But it was not long before he began to listen to foreign counsels, which saw danger for the whole peninsula in liberal measures. From that time, Naples became the scene of incessant conspiracy, insurrection, bloodshed, and political prosecutions. Ferdinand yielded to the storm of 1848, and granted a constitution to both parts of his dominions; he was even obliged to take part in the war against Austria in n. Italy. The Sicilians mistrusted, and with reason, the king's proceedings, and declared that he and his family had forfeited the Sicilian crown. F. followed the constitution so far as to call the chambers together, but quickly dismissed them, impatient of any interference with his authority. After the subjugation of Sicily 1849, when the reaction began to set in all over Italy, he hastened completely to set aside the new constitution; while all who had taken any part in state reforms were subjected to those cruel persecutions that the Letters of Mr. Gladstone have held up to the execration of the world. F. was succeeded by his son Francis II.

FERDINAND III., Grand Duke of Tuscany, Archduke of Austria: 1769, May 6—1824, June 18 (ruled 1790–1824, with interregnum 1799–1814); b. Florence; son of Leopold II., whom he succeeded in the government of Tuscany, when Leopold obtained the imperial throne at the death of Emperor Joseph II., Leopold's brother. F.'s rule in Tuscany was one of combined mildness and ability; and during his reign were inaugurated many judicial, economical, and legislative reforms: commerce was protected and encouraged; hospitals and asylums founded, good roads opened through the state, and the greatest attention bestowed on the welfare of his subjects. A lover of peaceful progress, he remained strictly neutral in the first coalition against France, and was the first sovereign in Europe to recognize and treat diplomatically with the French Republic, 1792. In 1793, intimidated by the combined menaces of the Russian and British cabinets, F. was constrained to relinquish his neutral policy, and become a passive member of the coalition formed by the above governments against France. In 1795, on the French occupation of Piedmont, he speedily reassumed friendly relations with France. In 1797, to save his states from annexation

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to the Cisalpine Republic, F. concluded a treaty with Bonaparte on most unfavorable terms; undertaking to pay a war-levy to France, and to transfer to the Museum of Paris some of the chief master-pieces of the Florentine galleries, including the *Venus de' Medici*. Owing to the continued intrigues of France in his states, F. was forced to seek an Austrian alliance, which furnished Bonaparte with a pretext for declaring war simultaneously against Austria and Tuscany. In 1799, F. retired to Vienna, leaving the French troops in occupation of Tuscany. In 1801, at the place of Lunéville, he was forced to renounce all claim on Tuscany. In 1814, the peace of Paris reinstated him in Tuscany, and even restored his artistic treasures. This just and enlightened prince at his death left his states to his son Leopold III.

FERDINAND, Duke of Brunswick: 1721, Jan. 11—1792, July 3; fourth son of Duke Ferdinand Albert of B.: famous general. He received a thorough military education, entered the Prussian service at an early age, distinguished himself as col. in the first and second Silesian wars, and was given command of a division at the beginning of the seven years' war. Shortly after the memorable victory at Prague 1757, to which he contributed largely, George II. of England appointed him to the supreme command of the allied forces, with which he held both the imperial army and several subordinate French ones at bay for five years, notwithstanding his opponents were more numerous and better organized and officered than his own troops. During this period he gained a notable victory over the French under Marshal Contades at Minden, 1759, Aug. 1. An irreconcilable estrangement occurred between F. and Frederick the Great 1766, which resulted in the former retiring wholly from military service. He retired to his duchy, built the castle of Veschelde, and spent the remainder of his life in promoting educational and artistic enterprises, and in helping the poor.

FERE, or **FEERE**, *n. fēr*: see **FEER** 2.

FERENTINO, *fā-rèn-tē'nō*: town of central Italy, province of Rome, about 50 m. s.e. of the city of Rome. Portions of the ancient walls remain, built in the cyclopean style of large irregular and polygonal blocks of limestone, patched or surmounted with Roman masonry without mortar. F. is the anc. Ferentinum, a city of the Hernici. Pop. 8,000.

FERETORY, *n. fēr'ē-tēr-ī* [*L. fērētrūm*, a bier—from *fero*, I bear: It. *feretro*]: the bier or shrine containing the relics of saints, borne in processions; the place in a church where the bier is set.

FERGHANA, *fēr-gā'nā*: Russian province of central Asia, formerly the khanate of Khokan (q.v.). F. is an anc. name of the city of Khokan, now the chief town of the province. F. is surrounded on three sides by the w. ranges of the Thian Shan Mountains, and its climate is generally healthful. One-third of the people are nomads. Pop. (1870) 900,000.

FERGUSON, *fēr'gū-son*, **ADAM**: Scottish philosopher

FERGUSON.

and historian: 1724-1816, Feb. 22; b. Logierait, in Perthshire, Scotland, where his father was parish minister. He studied at the universities of St. Andrews and Edinburgh, and was appointed (1744) chaplain to the 42d regt., in which capacity he was in the battle of Fontenoy, and is said to have charged the enemy sword in hand, among the foremost of his regiment. In 1757, he succeeded David Hume as keeper of the Advocates' Library in Edinburgh. He was appointed prof. in the Edinburgh Univ., first of natural philosophy 1759, and of moral philosophy 1764. In 1778-9 he acted as sec. to the commission sent out by Lord North to try to arrange the disputes with the N. American colonies. The state of his health induced him, 1784, to resign his professorship, in which he was succeeded by Dugald Stewart. He died in St. Andrews. His chief works are—*Essay on the History of Civil Society* (Lond. 1767), *Institutes of Moral Philosophy* (Lond. 1769), *History of the Progress and Termination of the Roman Republic* (Lond. 1783), and *Principles of Moral and Political Science* (Lond. 1792). The work by which he is best known is his *History of the Roman Republic*; this, with the *Essay* and *Institutes*, have gone through a number of editions. All his works have been translated into German and French, and the *Institutes* has been used as a text-book in several universities.

FERGUSON, fēr'gū-son, JAMES: 1710-76; b. near Keith, a village in Banffshire, Scotland. His father being a poor day-laborer, he had only three months of instruction at school. His tastes were for practical mechanics and astronomy; and while keeping sheep, to which he was early sent, he was constantly employed in making models of mills, etc., and at night in studying the stars. After working at various country employments, he took to drawing patterns for ladies' dresses, and copying pictures and prints with pen and ink. He then supported himself and his parents by drawing portraits, first in Edinburgh, afterward (1743) in London; his leisure time being all the while given to astronomical pursuits. In 1748, he began lecturing with great acceptance on astronomy and mechanics. He was elected a fellow of the Royal Soc. 1763, and received from George III. a pension of £50. His principal works are—*Astronomy explained upon Sir Isaac Newton's Principles* (1756; Sir David Brewster's ed. 2 vols. 1811); and *Lectures on Mechanics, Hydrostatics, Pneumatics, and Optics* (1760; also edited by Brewster 1805). See his *Life* by Dr. E. Henderson, with *Autobiography* (2d ed. 1870).

FERGUSON, JAMES: 1797, Aug. 31—1867, Sep. 26; b. Perthshire, Scotland: engineer and astronomer. He came to the United States 1800: studied civil engineering and surveying, and was employed as asst. engineer on the Erie canal 1817-19, asst. surveyor on the boundary commission under the treaty of Ghent, 1819-22, astronomical surveyor on the same commission 1822-27, civil engineer for the state of Penn. 1827-32, first asst. of the U. S. coast survey 1833-47, and asst. astronomer of the U. S. naval observatory 1847-67. He discovered the asteroids *Euphrosyne* (1854),

FERGUSON—FERIAL.

Virginia (1857), and *Echo* (1860), for which he received the astronomical prize medals of the French Acad. of Sciences, 1854, 60.

FERGUSON, SAMUEL DAVID, D.D.: Prot. Episc. bp. of W. Africa: b. Charleston, S. C., 1842, Jan. 1. When 6 years old he removed with his parents to the republic of Liberia, Africa, and was educated in the mission schools established there by the Prot. Episc. Church. He became a teacher 1862, deacon 1865, priest 1868, and missionary bp. for W. Africa 1885. He was consecrated in New York 1885, June 24, and directly afterward returned to his station at Cape Palmas. For 20 years prior to his consecration, he had been an active promoter of the missionary and educational interests of his church.

FERGUSON, *fer'güs-son*, JAMES, D.C.L., F.R.S., LL.D.: 1808-1886, Jan. 9; b. Ayr, Scotland: architect, and eminent writer on architecture. He was educated in Edinburgh and London, spent several years in mercantile business in India, and then applied himself to studying the various styles of architecture in eastern countries. He published the results of his researches with many illustrations in *Illustrations of the Rockcut Temples of India* (1845); *Picturesque Illustration of Ancient Architecture in Hindostan* (1847); *Handbook of Architecture* (1855); *Essay on a Proposed New System of Fortification by Earthworks* (1849); *The Palaces of Nineveh and Persepolis Restored* (1851); *History of the Modern Styles of Architecture* (1862); *History of Ancient and Modern Architecture*, 3 vols. (1868), and *Temples of the Jews and the Other Buildings in the Haram Area at Jerusalem* (1878). He was architect of the Nineveh Court in the Crystal Palace at Sydenham, received the royal gold medal of the Royal Institute of British Architects 1871, Apr. 17, and was given the degree LL.D. by the Univ. of Edinburgh 1878, Aug. His *History of Ancient and Modern Architecture* is one of the most complete and valuable works in that department.

FERGUSON, ROBERT: Scottish poet: 1751, Oct. 17—1774, Oct. 16; b. Edinburgh. He received his education at the Univ. of St. Andrews, removed to Edinburgh, and was employed in the office of the commissary clerk. His poems were chiefly contributed to *Ruddiman's Weekly Magazine*, and gained considerable local reputation, which proved his ruin. His society was eagerly sought; and in that convivial time, he was led into excesses. He fell into a religious melancholy, and finally, through an accidental fracture of the skull, became totally deranged. His poems published 1773, show mastery over Lowland Scotch. To some extent the forerunner of Burns, who admired his works.

FERIAL, a. *fē-rī āl* [L. *feriæ*, holidays, festivals]: pertaining to holidays. FERILÆ, in anc. Rome, holidays during which political and legal transactions were suspended, and slaves enjoyed cessation from labor. *Feriæ* were thus *dies nefasti*, opposite of the *dies fasti*: see FASTI. Days consecrated to a particular divinity, on which any public ceremony was celebrated, and the like, were *feriæ*. In distinction from these which were *feriæ publicæ* (public holidays) there were

FERID-EDDIN-ATHAR—FERLIE.

feriæ privatae, observed by single families, in commemoration of some important event in their annals. Birthdays, days of purification after a funeral, etc., also were observed as family *feriæ*. The public *feriæ* were divided into those always kept (*stativæ*) on certain days marked in the calendar; and those which were kept by command of the consuls or other superior magistrates on any public emergency. On all public *feriæ* the people generally visited the temples of the gods, and offered prayers and sacrifices. The most serious and solemn seem to have been the *feriæ imperativæ*; all the others were generally attended by rejoicings and feasting. See an elaborate article by Dr. Schmitz in Smith's *Dictionary of Greek and Roman Antiquities*.

FERID-EDDIN-ATHAR, *f'êh-rêd' êd-dên' â-târ'* or **FARID-UDDIN-ATTAR**, 1119-1229; b. Kedken, Persia: poet and mystic. His real name was Muhammed ben Ibrahhim, Ferid-Eddin being an honorable title equivalent to 'Pearl of Religion.' He was a druggist or perfumer by trade. Early in life he became interested in the mystery of man's higher life, and abandoning his business, began studying the theosophy of the Sufis under Sheikh Rekenuddin. He entered into the spirit of that religion with so much earnestness, that he was before long recognized as one of its principal representatives, and after making the pilgrimage to Mecca was invested with the Sufi mantle by Sheikh Majduddin of Bagdad. He was a voluminous writer, and left about 120,000 couplets of poetry, doubtless written in early and middle life, as in his later years he carried his asceticism so far as to deny himself the pleasures of composition. His chief work was the *Mantic Uttair*, or language of birds, the text of which was published by Garcin de Tassy, the *Orientalist*, 1857.

FERINE, a. *f'êrîn* [L. *ferînis*, pertaining to wild beasts—from *fērû*, a wild beast]: pertaining to, or like, a wild beast; savage. **FE'RITY**, n. *-rî-tî*, cruelty; barbarity. **FERAL**, a. *f'êrâl*, wild; in a state of nature.

FERINGEE, n. *f'êr-îng'gê*, but properly **FURUNGEE**, n. *fûr-ûng'gê*, or **FARANGI**, n. *fâr-ûng'gê* [Pers. *Farang*, Europe: comp. F. *franc*, free, a Frank]: in the *East*, a Frank; a European or white man: **ADJ.** European; generally applied by natives to the Portuguese and other mixed races as an insulting name.

FERIO, n. *f'êr'î-ô* [a mnemonic word]: in *logic*, a mode in the first figure of syllogisms, in which the middle term is made the subject of the major and the predicate of the minor premise. It is composed of a universal negative, a particular affirmative, and a particular negative. Example: **FER**, No A is B. **I**, Some C is A. **O**, Some C is not B.

FERISO, n. *f'êr'î-sô*, or **FERISON**, *f'êr'î-son* [a mnemonic word]: in *logic*, a mode in the third figure of syllogisms, in which the middle term is the subject both of the major and the minor premises. Feriso differs from Felapton in that the minor premise is a particular instead of a universal affirmative.

FERLIE, or **FERLY**, n. *f'êr'î*, also **FARLIE**, n. *fâr'î* [AS.

FERM—FERMATA.

faerlic, sudden, fortuitous: Icel. *ferligr*, strange]: in *Scot.* and *prov. Eng.*, a wonder; a strange thing.

FERM, n. *fērm* [AS. *feorn*, food, board, entertainment—from AS. *feorh*; Icel. *fför*, life]: in *OE.*, a farm; rent for a farm; an abode; a dwelling.

FERMANAGH, *fēr-mā'n'a*: inland county in the s.w. of the province of Ulster, Ireland; 45 m. long, 29 broad; 714 sq. m., $\frac{2}{3}$ arable, $\frac{1}{10}$ in wood, and more than $\frac{1}{6}$ in water, including Upper and Lower Lough Erne, and the smaller lakes, Melvin and Macnean. The surface is mostly a succession of mountains and hills, and the scenery varies. The chief rocks are limestone, with many cavities and underground water-courses, millstone grit, and old red sandstone. Some coal, iron, and marble occur. The chief rivers are the Erne and its tributaries, the Colebrooke, Woodford, and Arney. The soil in the low grounds is a deep rich loam, but in the limestone and sandstone districts it is cold and thin. The climate is mild and moist. Marsh-fever prevails in summer and autumn near Lough Erne. In 1880, 104,622 acres were in crop; oats, barley, wheat, potatoes, turnips, and hay being the chief products. The chief exports are oats, butter, and eggs. F. is divided into 8 baronies and 23 parishes. It returns 2 members to parliament. Principal towns: Enniskillen, Lisnaskea, and Lowtherstown. A little coarse linen is manufactured in the county. In 1880 there were 16,844 pupils attending the national schools of F. The chief antiquities are raths or rude hill-forts, and some ecclesiastical ruins. Pop. (1851) 116,047; (1861) 105,372; (1871) 92,688; (1881) 84,879, of whom 47,228 were Rom. Catholics, 30,832 Episcopalians, and 1,672 Presbyterians; (1891) 74,037.

FERMAT, *fēr-mā'*, PIERRE DE: 1590-1665; b. Toulouse: French mathematician. At an early period, with his friend Pascal, he hit upon a very ingenious mode of considering figurate numbers, upon which he subsequently based his doctrine of the calculation of probabilities. F. gave much study to the properties of numbers, and made many acute discoveries in regard to their composition and analysis. He also squared the parabola in a much simpler way than Archimedes had done, and made many other discoveries in geometry. His method of finding the greatest and least ordinates of curved lines was analogous to the method of the then unknown differential calculus. In addition to his scientific attainments, F. had extraordinary knowledge of ancient and modern languages. He died at Toulouse. A collection of his works appeared at Paris, 1679.

FERMATA, *fēr-mā'tā*, in Music. pause or resting-point, generally marked by the sign \frown . The notes over which this sign is placed are prolonged beyond their true length. The F. is frequently found near the end of a part of a composition, which affords an opportunity for the singer or player to introduce an extempore embellishment.

FERMENT—FERMENTATION.

FERMENT, v. *fër-měnt'* [*F. ferment*—from *L. fermentum*, leaven—from *fervĕō*, I boil; *It. fermento*]: to cause to rise or swell by yeast, as dough; to cause to rise to froth by the addition of yeast; to effervesce; to produce a chemical change by some obscure agent which is not itself altered in the process—e.g., the change of sugar into alcohol, and alcohol into vinegar, by the alcoholic and acetic ferments respectively. **FERMENT**, n. *fër'měnt*, that which possesses the power of inducing fermentation—frequently a microscopic fungus; agitation; tumult; intestine motion. **FERMENT'ING**, imp.: **ADJ.** working; effervescing. **FERMENT'ED**, pp.: **ADJ.** having undergone the process of fermentation. **FERMEN'TABLE**, a. *-měnt'ă-bl*, capable of being fermented. **FERMEN'TABIL'ITY**, n. *-bĭl'ĭ-tĭ*. **FER'MENTA'TION**, n. *-tă'shĭn* [*F.—L.*]: a working or frothing up of any substance under the influence of warmth, air, and moisture; an internal motion caused by decomposition; the process of converting the juice of the grape into wine, or the liquid extract of malt into an alcoholic liquor, as beer. **FERMENT'ATIVE**, a. *-tă-tiv*, tending to cause fermentation. **FERMENT'ATIVENESS**, n. **VINOUS FERMENTATION**, that fermentation in which sugar is converted into carbonic acid and alcohol. **FERMENT-OILS**, n. in *chem.*, volatile oils produced by the fermentation of various plants, not originally contained therein, and different from the oils which are extracted from the unfermented plants by distillation with water. They were known to the alchemists, and by them designated quintessences. Ferment-oils are for the most part more soluble in water than ordinary volatile oils. They are generally formed by allowing the flowering plant to ferment in water; the liquid is distilled when the fermentation is ended, and the oil extracted from the distillate by slaking it with ether, which dissolves the oil; the ether is then allowed to evaporate.

FERMENTA'TION: the change which occurs in one organic substance when influenced by another in a state of decay or putrefaction. The process was originally understood to include all the changes which matter of plant or animal origin undergoes when disunited from the living force, but is now restricted to certain of the changes. Thus, there are many substances, such as starch and sugar, which have no power of themselves to pass into decay, or change in composition through long periods of time; while there is another class of substances, including albumen, fibrine, and caseine, as well as gelatinous tissues, mucus, etc., which, when exposed to moderately heated air in a moist condition, more or less rapidly begin to putrefy or decompose. The latter substances, viz., those which spontaneously pass into a state of change, are called *ferments*, and when they are brought in contact with sugar, etc., which otherwise would not be altered, they cause the latter to be broken up into simpler compounds; it is this process that constitutes fermentation. The ferment is always a body which has the power of rotting, and is actually in a state of decomposition. Every substance which is liable to putrefy becomes while putrefying, a ferment; and in this condition acquires

FERMENTED LIQUORS.

the property of starting the process of F. in any second body capable of it, and retains the power till it is so far decomposed that the putrescence is past. The ferments are very widely distributed in organic matter; hence, whenever a plant or animal dies, the process of fermentation proceeds more or less rapidly. The most important kind of F. is that known under the designation of *vinous*, and which forms part of the processes in the preparation of alcohol, beer, wine, etc. It consists in the action of a peculiar ferment called yeast (q.v.) upon a saccharine liquid, when the sugar ($C_6H_{12}O_6$) is decomposed into two molecules of alcohol (each C_2H_6O), and two molecules of carbonic acid (each CO_2). In this change it will be observed that the yeast, while it causes the change, does not unite directly or indirectly with any of the constituents of the sugar. The *vinous* F. proceeds best at a temperature ranging from 60° to 80° F., the mean and more desirable being about 70° F. The process itself causes the development of heat, and recourse must be had, therefore, to large airy rooms, where the fermenting tuns or vessels are arranged, and also to the circulation of cold water in pipes distributed round the interior of the vessels, and in contact with the liquid. See BEER.

The *lactic acid* F. takes place in milk when it begins to sour. The caseine of the milk acts the part of the ferment, and it causes the change in the sugar of milk, which is in part resolved into lactic acid ($C_3H_5O_3$). The latter then curdles the caseine, and the milk becomes clotted. When the milk still further sours, and the material is kept at a temperature of 77° to 86° F., the *butyric acid* F. takes place, in which the putrefying caseine changes the sugar (q.v.) of milk into butyric acid ($C_4H_7O_2$).

The *viscous* or *mucus* F. occurs when the juice of the beet-root, dandelion, ash-tree, etc., is allowed to decompose at a temperature of 90° to 100° F., when the albuminous matter present causes the sugar to ferment into lactic acid, mannite, a gummy substance, some alcohol, and various gases. The same kind of F. occurs when boiled yeast or boiled gluten is added to ordinary sugar.

The remaining processes of F. are the *benzoic*, yielding, among other matters, the Essential Oil of Bitter Almonds (q.v.); the *sinapic*, which occurs in mustard when moistened with water, and during which the pungent oil of mustard is developed; and the *acetous*, which is, however, not a true instance of F., as the oxygen of the air is required to complete the change: see ACETIC ACID.

FERMENTED LIQUORS: alcoholic beverages made by fermentation of saccharine fluids and juices; the principal being the different kinds of *ale* or *beer*, made by fermentation of an infusion of malt, chiefly of barley, but sometimes of other kinds of grain; and *wine*, made by fermentation of grape-juice. *Cider* is made by fermentation of the juice of apples; *perry*, of that of pears; *palm-wine*, by fermentation of the sap of different kinds of palm. Fermented liquors, commonly called wines, are made also from the juice of various kinds of fruit, as currant wine

FERMENTED LIQUORS.

from that of the red currant; and from the juice of some roots, etc. The sap of the American Aloe, or *Agave* (q. v.), yields the fermented liquor called *Pulque*, much used in Mexico. A wine is made from the sap of the birch, and that of some other trees is used for a similar purpose. *Mead* is a fermented liquor made from honey. From every fermented liquor, a kind of *spirit* may be obtained by distillation: see BEER: SPIRIT: WINE.

STATISTICS OF FERMENTED AND DISTILLED LIQUORS.

—In Great Britain the quantity of wine entered for consumption (1802) was 5,449,710 gals., upon which duty of £1,723,339 was paid; (1851) 6,280,653 gals., paying duty of £1,776,246; (1880) total imports 17,385,496 gals., of which 15,852,382 were entered for home consumption; (1895) entered for home consumption 14,635,568 gals.; total value of wine imported (1895) £5,412,084, paying duty of £1,143,698. The world's wine product for 1893-4 was 3,432,150,000 gals. The consumption of beer in 1895 was 1,160,126,748 gals., valued at £87,009,506; (1896) 1,198,968,000 gals., giving for a population of 39,465,720 a per capita consumption of 30.13 gals. The manufacture of beer for 1883 was 27,141,466 barrels; (1893) 32,104,516 barrels; (1896) 33,826,354 barrels or 1,217,748,784 gals. The number of brewers has steadily decreased from 15,071 in 1883 to 9,664 in 1893 and 8,785 in 1896, owing to the concentration of the brewing industry in the hands of large capitalists, and accompanied by an increase of product and consumption, as shown by the figures given above for the same years. The world's production of malt liquors for 1894 was 5,477,862,221, the chief producing countries besides the United Kingdom being Germany, 1,466,129,420 gals.; North and South America, 1,323,563,026 gals.; Austria-Hungary, 484,938,000 gals.; Belgium, 252,856,814 gals.; France, 223,056,827 gallons; Russia, 122,080,090 gals.

IMPORTS OF SPIRITS AND WINES INTO THE UNITED STATES, 1824-95.

Fiscal.	Value in \$.	Fiscal.	Value in \$.	Fiscal.	Value in \$.
1824	3,193,518	1847	3,170,167	1870	7,587,676
1825	3,961,473	1848	3,095,238	1871	8,638,441
1826	3,368,900	1849	3,790,733	1872	8,582,223
1827	3,272,471	1850	5,372,063	1873	9,253,469
1828	3,839,189	1851	5,198,758	1874	8,636,469
1829	3,017,476	1852	4,644,053	1875	7,769,527
1830	2,194,092	1853	7,139,939	1876	6,594,551
1831	2,710,795	1854	6,872,565	1877	6,061,497
1832	3,752,497	1855	6,069,481	1878	5,517,427
1833	3,806,723	1856	9,655,400	1879	6,037,303
1834	4,263,633	1857	6,801,467	1880	7,736,532
1835	5,383,289	1858	5,478,840	1881	8,742,201
1836	6,249,415	1859	6,870,206	1882	9,849,533
1837	5,576,543	1860	8,712,817	1883	12,308,307
1838	3,795,200	1861	6,748,281	1884	8,951,723
1839	5,664,123	1862	2,511,141	1885	9,379,223
1840	3,801,740	1863	3,517,810	1886	10,036,287
1841	3,834,648	1864	4,758,117	1887	9,011,553
1842	2,157,885	1865	2,406,408	1891	12,216,796
1843	575,541	1866	6,917,869	1892	11,894,998
1844	1,787,982	1867	5,756,998	1893	13,207,464
1845	2,091,306	1868	4,598,013	1894	9,149,608
1846	3,170,965	1869	6,272,491	1895	9,914,278

FERMENTED LIQUORS.

LIQUORS IMPORTED FOR CONSUMPTION IN YEAR ENDING 1895, JUNE 30.

ARTICLES.	Quantities.	Values.	Ordinary Duties.	Duty <i>Ad Val.</i>
MALT LIQUORS	943,939	\$900,037	\$637,512	39.01
Ale, beer, porter, in bottles.				
Do. not in bottles	2,027,737	614,808	2,594,366	125.75
DISTILLED SPIRITS	313,327	813,882		
Brandy	1,139,710	1,246,567		
All other				
WINES	257,757	3,807,961	3,697,826	51.15
Champagne	2,780,153	1,945,357		
Still wines, casks	296,779	1,430,229		
Do. in other coverings				
Total		\$10,758,841	\$6,929,704	

MANUFACTURE OF LIQUOR IN THE UNITED STATES.

1870.						1890 (as reported in U. S. Census).					
CLASS.	Estab-lishm'ts.	Capital.	Hands.	Wages.	Value Products.	CLASS.	Estab-lishm'ts.	Capital.	Hands.	Wages.	Value Products.
		<i>Millions.</i>		<i>Millions.</i>	<i>Millions.</i>			<i>Millions.</i>		<i>Millions.</i>	<i>Millions.</i>
Distilled	719	15.5	5,131	2.0	36.1	Distilled	440	51	5,343	2.8	104.19
Malt	1,972	48.7	12,443	6.7	55.7	Malt	1,248	232	34,800	28.3	182.7
Vinous.	398	2.3	1,486	0.2	2.2	Vinous	236	5.7	1,248	.48	2.8

FERMO—FERN.

ANNUAL CONSUMPTION OF FERMENTED LIQUORS IN THE UNITED STATES
FOR TEN YEARS (1886-95).

Year ending June 30.	Amount Consumed.		Per Capita Consumption.		
	Wine.	Beer.	Wine.	Beer.	Total.
	<i>Gallons.</i>	<i>Gallons.</i>	<i>Gallons.</i>	<i>Gallons.</i>	<i>Gallons.</i>
1886	25,567,220	642,967,720	.45	11.20	12
1887	32,325,061	717,748,854	.55	11.23	13.99
1888	36,335,065	767,587,056	.61	12.80	14.67
1889	34,144,477	779,897,426	.56	12.72	14.60
1890	28,956,081	855,792,335	.46	13.67	15.53
1891	29,033,792	977,479,761	.45	15.28	17.16
1892	28,467,860	987,496,223	.44	15.10	17.04
1893	31,987,819	1,074,546,336	.48	16.08	18.04
1894	21,293,124	1,036,319,222	.31	15.18	16.82
1895	19,644,049	1,043,292,106	.28	14.95	16.35
Total..	287,755,451	8,883,127,039	.46	11.64	15.79

FERMO, *fēr'mō*: town of Italy, province Ascoli Piceno, on a rocky height 4 m. from the Adriatic, 32 m. s.s.e. of Ancona. It is well-built and fortified, surrounded with walls and ditches, is the seat of an archbishop, and has a cathedral and a elegant theatre. Formerly A. possessed a university. It has some trade in corn and wool. In the immediate vicinity are the ruins of the ancient Firmum, whose name F. inherits. Firmum had been a Roman colony from B.C. 264. Pop. 15,682.

FERMOY, *fēr-moy'*: town in the e. of Cork county, Ireland, chiefly on the right bank of the Blackwater, 19 m. n.e. of Cork city. Its origin dates from the 12th c., when it was the seat of a great Cistercian abbey; but its present importance dates from the end of last century. The hills of the town rise in Knockinskeagh 1,388 ft. F. is handsomely built and regularly laid out. A large ecclesiastical establishment (Rom. Cath.), consisting of a church, a bishop's house, two convents with large schools, and a college with nearly 100 students, has recently been erected on a hill rising from the Blackwater. A bridge of 13 arches, built 1689, crosses the river. Infantry and cavalry barracks for 3,000 men stand on the left bank of the river, and command the approach to Cork. F. has a trade in agricultural produce. Pop. (1871) 7,611; (1881) 6,454.

FERN, n. *fēr'n* [AS. *fearn*, fern: Sw. *fara*, to go—applied to events produced by diabolic art: AS. *fær* death, sudden death]: a family of cryptogamic plants, usually with broad feathery leaves or fronds—probably so named from the reputed use of their seeds in magical incantations (see FERNS). FERNY, a. *fēr'n'i*, abounding in ferns. FERNERY, n. *fēr'n'ēr-ī*, a place where ferns are grown or cultivated. MALE FERN, name given, in consequence of an erroneous notion, long since exploded, to a fern very common in the woods of Britain and of the continent of Europe, the *Aspidium filix mas* of some botanists, and *Lastrea filix mas* and *Nephrodium filix mas* of other. The fronds are bipinnate; the pinnules oblong, obtuse, and serrated; the sori

FERN—FERNANDEZ.

near the central nerve, orbicular, kidney-shaped, and fixed by the sinus; the stripes and rachis chaffy. It is a chief ornament of many forests, and a plant of considerable beauty. The subterranean stem (rhizome) is officinal. It is about 12 inches long, and of the thickness of a quill, almost inodorous, with a nauseous sweet taste, becoming astringent and bitter. It was anciently used as an anthelmintic, and its use has been revived, especially in cases of tapeworm, in which it is believed to be very efficacious. Its anthelmintic powers are due to a thick, almost black



Common Male Fern.

volatile oil which it contains, and which also is now used in medicine. SWEET FERN (*Comptonia asplenifolia*), shrub of the nat. ord. *Amentaceæ*, sub-order *Myriceæ*, native of the mountain-woods of N. America, forming a small bush with linear pinnatifid, fern-like leaves. Its leaves have a powerful aromatic fragrance when rubbed. It is tonic and astringent, and is used in the United States as a domestic remedy for diarrhea. FERN-SEED, n. the seeds or spores of ferns; these were formerly supposed to possess supernatural virtues, such as rendering a person invisible. *Note*.—Sheat gives the origin of *Fern*, Dut. *varen*; Ger. *farnkraut*, feather-plant; Skr. *parṇa*, a wing, a feather.

FERN, FANNY: see PARTON, JAMES.

FERNANDEZ, *fēr-nān'dēz*, JUAN: Spanish navigator and discoverer. In 1563 he discovered the two islands which bear his name, and solicited the concession of them from the govt. on account of their beauty and fertility. His petition was granted 1572, and he planted a short-lived colony on the largest island. The adventures of Alexander Selkirk on this island are supposed to have formed the basis of De Foe's story, *Robinson Crusoe*. In 1574 F. discovered the islands of St. Felix and St. Ambrose, and his surviving

FERNANDINA—FERNAN-NUNEZ.

companions affirmed that during a voyage in the s. ocean 1576, he came in sight of a continent which must have been either Australia or New Zealand if the discovery is to be taken as a fact.

FERNANDINA, *fēr-nân-dē'na*: city, cap. of Nassau Co., Fla.; on Amelia Island, bet. Nassau and Prince William Sounds, separated from the main land by a channel known as Amelia river; 28 m. n.n.e. of Jacksonville, 36 m. s. of Brunswick, Ga.; n.e. terminus of the Atlantic Gulf and W. India Transit railroad. It is a port of entry and has a deep, commodious, and safe harbor, the entrance of which is marked by a light-house; and Fort Clinch. The industries comprise the manufacture of lumber, sash, blinds, and cotton-seed oil, and foreign and coastwise trade in cotton and naval stores. It contains a court-house, 5 white and 4 colored churches, a Rom. Cath. acad., private bank, weekly newspaper; is the seat of the Prot. Episc. bp. of Fla.; and is a popular summer and winter resort with tri-weekly steamboat connection with Charleston and Savannah. Pop. (1870) 1,722; (1880) 2,562; (1890) 2,803.

FERNANDO DE NORONHA, *fēr-nân'dō dā nō-rōn'ya*: lonely island of the Atlantic, about 125 m. from the coast of Brazil, to which it belongs. It is about eight m. in length. Pop. 2,000 (largely convicts).

FERNANDO PO, *fēr-nân'dō pō*: island on the w. coast of Africa, in the Bight of Biafra, about 20 m. from the nearest point on the shore; about 44 m. long, 20 m. broad. The appearance of this island from the sea is exceedingly picturesque and beautiful. It is traversed by a mountain-ridge, which, in Clarence Peak, rises to the height of 10,650 ft., and is fertile, well-watered, and in many parts thickly wooded. Besides swarms of monkeys, some of great size, the island contains many goats and sheep in a state of nature. The climate, always excessively hot, is rendered intolerable, during the rainy season, by a pestilential wind from the continent. The native population are of negro race, and are said to inhabit 15 villages. The English, with the consent of Spain, into whose hands F. P. had fallen, made an attempt 1827 to form a settlement on the island, but abandoned it 1834. In 1844, it was again taken possession of by Spain. The colony has a population of about 900, most of whom are liberated Africans. Pop. of the island (native), 10,000 to 12,000.

FERNAN-NUNEZ, *fēr-nân'nōn'yēth*: small town of Spain, province of Cordova, 10 m. s. of the town of Cordova. It has some linen and woolen manufactures. Pop. 5,500

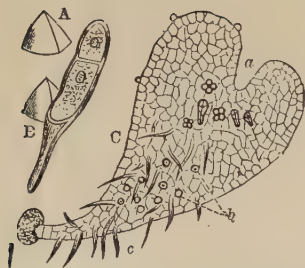
FERNS.

FERNS (*Filices*): order of flowerless plants (see **EX-ANNULATE**), belonging to the sub-kingdom or series *Pteridophyta*, which includes also the *Equisetaceæ*, Horsetails, and the *Lycopodiaceæ*, Club-mosses. F. are either herbaceous perennial plants, or more rarely trees, the root-stock or the stem producing leaf-like *fronds* (often called leaves), which are sometimes simple, sometimes pinnated, or otherwise compound, have great variety of form, and are generally coiled up (*circinate*) in bud (see accompanying illustration). The fronds are traversed by veins,



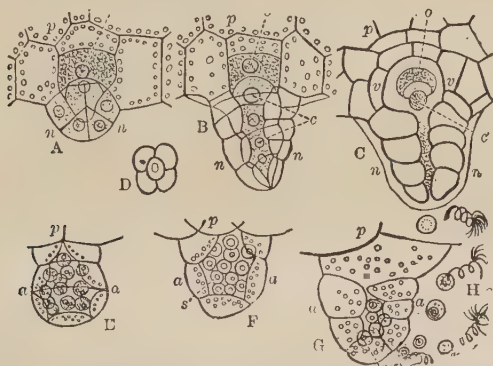
Ceterach Officinatum.

generally of uniform thickness, which are simple or forked, or netted, sometimes produced from the sides of a midrib or primary vein, sometimes from a primary vein on one side, sometimes radiating from the base of a frond or segment of a frond. The fructification takes place either on the lower surface or on the margin of the fronds, and arises from the veins. The spores are contained in capsules or spore-cases (*thecae*, *sporangia*), which are often surrounded with an elastic ring, and are either naked or covered with a membrane (*involucre* or *indusium*), and are generally clustered in round or elongated or kidney-shaped masses (*sori*). The margin of the frond is sometimes folded so as to cover the spore-cases, and sometimes, as in the Flowering Fern (*Osmunda*) (q v.), the fertile part of the frond is so transformed that its leaf-like character entirely disappears, and it becomes a spike or panicle. The spore-cases burst at their circumference, or irregularly, scattering the spores which germinate into the *prothallus*, a minute kidney-shaped cellular expansion with unicellular root hairs.

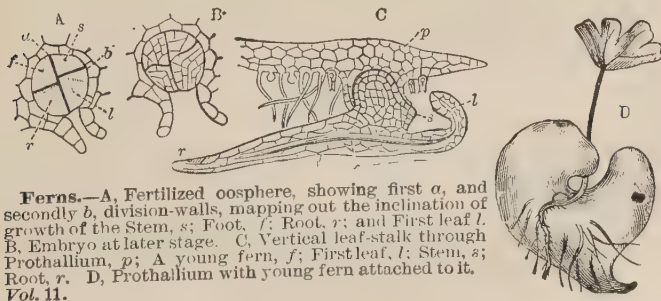


Feretary.

Ferns. — Germination of Prothallium: A, Spore; B, Germinating spore; C, Undersurface of prothallium, showing Archegonia, *a*; Antheridia, *b*; Rhizoids, *c*.



Ferns.—A-D, Archegonia; A-C, Longitudinal sections; D, Transverse section of neck; *p*, Prothallium; *n*, Neck of archegonium; *c*, Neck canal cells; *v*, Venter of archegonium; *o*, Oosphere. E-G, Antheridia in transverse section; *p*, Prothallium; *a*, Antheridium; *s*, Spermatocytes. H, Spermatozoids, *s'*, escaping from their vesicle, *v*, which contain starch grain.



Ferns.—A, Fertilized oosphere, showing first *a*, and secondly *b*, division-walls, mapping out the inclination of growth of the Stem, *s*; Foot, *f*; Root, *r*; and First leaf *l*. B, Embryo at later stage. C, Vertical leaf-stalk through Prothallium, *p*; A young fern, *f*; Firstleaf, *l*; Stem, *s*; Root, *r*. D, Prothallium with young fern attached to it.

FERNS.

On the under surface of this, arise male and female reproductive organs, the *Antheridia* and *Archegonia*. The former develop ciliated spiral filaments, the 'antherozoids;' the latter, an oosphere from which, when fertilized, the 'fern' arises, an alternation of generations (see GENERATIONS, ALTERNATION OF) thus taking place.—The species of F. are about 2,500. They are found in all parts of the world but fewer toward the poles than within the tropics, and fewer in continental than in maritime countries, abounding exceedingly in mountainous tropical islands, as in Jamaica. Many of them delight in moisture and shade, though some are found in most exposed situations. Some



Ferns:
Showing the Sori on the back of the Fronds.

resemble mosses in size and appearance; while Tree Ferns (q.v.) resemble palms, and sometimes attain a height of 40 ft. A few are climbers. One climbing species (*Lygodium palmatum*) is found in the United States as far n. as Boston.—F. are divided into *Polypodiæ*, *Hymenophyllæ*, *Gleicheniæ*, *Schizææ*, *Osmundææ*, *Danaææ*, and *Ophioglossææ*, of which sub-orders (or orders) the first contains a great majority of all ferns.—The root-stocks of some F. contain so much starch that they are used as food, or food is prepared from them, particularly those of the Tara (q.v.) Fern in New Zealand and Van Diemen's Land, and those of *Aspidium* (or *Nephrodium*) *esculentum* in Sikkim and Nepal; also the stems of some of the tree-ferns, as of *Cyathea medullaris* in New Zealand, and *Alsophila spinulosa* in India. The young and tender fronds of some F. are occasionally used as pot-herbs in the highlands of Scotland, Norway, the Himalaya, etc. The fronds are generally mucilaginous, slightly aromatic and astringent. Those of some species of Maidenhair (q.v.) are used for making *capillaire*; while the bitter and astringent root-stocks of some F. are occasionally used in medicine, as those of the Male Fern (see under FERN) and the Peruvian *Polypodium Caliguala*, particularly as anthelmintics). The fronds of a few species are delightfully fragrant.—The cultivation of F. is now in many places conducted, both in the open air and in hothouses; and to such an extent has the occupation of fern-collecting reached, that many excellent treatises on it have been written and elaborately illustrated: Among

FEROCIOUS—FEROZE PORE.

manuals. Gray's includes American F., with accompanying plates, illustrating genera. The magnificent nature-printed work, 2 vols. royal 8vo., by Henry Bradbury, supplies all needful information. Wardian cases, filled with F., have become common ornaments of apartments. For the principal species see their titles.

FEROCIOUS, a. *fě-rō shūs* [L. *fērox*, or *fērōcēm*, fierce, cruel: It. and F. *féroce*; comp. Gael. *fiargach*, angry]: savage; fierce; wild; ravenous. **FEROCIOUSLY**, ad. *-lī*. **FEROCIOUSNESS**, n. or **FEROCITY**, n. *-rōs'ī-tī* [F. *féroçité*, fierceness—from L. *ferocitātem*]: savage wildness; inhuman cruelty.

FER OLIGISTE, *fēr ōl-ī-zhīst*: mineralogical term applied to a variety of anhydrous red oxide of iron (Fe_2O_3), otherwise called *Specular Iron Ore*. The famous Swedish, Russian, and Elba iron are in greater part prepared from this iron ore. The natural position of feroligiste is in the primary rocks. See **IRON**.

FERONIA, *fě-rō nī-a*: in *Rom. myth.*, a goddess, commonly ranked among the rural divinities, and worshipped with great solemnity both by the Sabines and the Latins, especially by the former. In *astron.*, an asteroid, the 72d found. It was discovered by Peters, 1862, January 9. In *bot.*, a genus of Aurantiaceæ (citronworts), the order to which the orange belongs. The only known species is the wood-apple or elephant-apple (*Feronia elephantum*). It is a large and handsome tree of the East Indies.

FEROSH, n. *fě-r'ōsh* [Hind. *furash*]: an Indian servant in charge of tents, furniture, etc. He is expected to sweep the ground and spread carpets.

FEROZABAD, *fě-rō-zā-bād*: town of India, N.W. Provinces, 24 m. e. from Agra. It was formerly named Chandwar, and was of much greater importance than at present. Its fine edifices are mostly in ruins. Pop. 15,000.

FEROZE PORE, *fě-rōz-pór'*: named from its founder, Feroze Toghluq (reigned in Delhi 1351-88); in the Punjab; about 3 m. from the left or s.e. bank of the Sutlej, lat. $30^{\circ} 55'$ n., and long. $74^{\circ} 35'$ e. Formerly a large and important town, as its massive fortifications and extensive ruins indicate, it had sunk into poverty and insignificance, before it came 1835 into the possession of the English. Since then, the place has regained much of its former consequence, holding out, with its wide streets and its colonaded bazars, the promise of a great emporium of commerce. Politically, too, F. P. has become prominent under British supremacy, having been a starting-point, whether for war or for negotiation, in many British dealings with Afghanistan and the Punjab. In connection with this feature in its history, the city contains a monumental church in honor of the memory of those, both privates and officers, who fell in the various conflicts with the Sikhs. Pop. (1891) 50,437.

FEROZE PORE is the name also of a district, of 2,752 sq. m. It is now in part either barren or covered with jungle, but the ruins of towns and villages indicate that it must

FEROZE SHAH—FERRARA.

have been anciently both more fertile and more populous. Pop. (1868) 549,253; (1881) 650,519.

FEROZE SHAH, *fēr-rōz-shā'*: village apparently within the dist. of Feroze Pore, about 10 m. e.s.e. of the town of Feroze Pore; lat. $30^{\circ} 52'$ n., and long $74^{\circ} 50'$ e.; about 12 m. from the left bank of the Sutlej. It is noted as the scene of the second in order of the four great battles of the first Sikh war. The battle, which lasted two days, 1845, Dec., ended in the rout of the natives and the capture of their intrenchments. The British army was commanded by Sir Hugh Gough and Sir Henry Hardinge; and, as in the victory of Mudki, gained only three days before, it sustained heavy loss.

FEROZE SHAH CANAL: artificial water-course, for irrigation; of historical interest and economical value; length, including its branches, 240 m. It dates back as far as 1356, owing its origin and name, to Feroze Toghluk (reigned in Delhi 1351-88). Viewed as a whole, it leaves the right bank of the Jumna in lat. $30^{\circ} 19'$ n.; and, after sweeping round so as to skirt Sirhind, a territory on the Sutlej, it rejoins its parent stream at Delhi in lat. $28^{\circ} 39'$, thus measuring, in mere difference of latitude, 100 geographical miles. As is usual in the East, this important channel was so much neglected, that, in the beginning of the 17th c., it was cleared out by Vizier Ali Murdan Khan, who in fact was the first to carry it, through its lower half, back into the Jumna. Finally, the entire line has, in the 19th c., been again repaired and improved by the British government.

FERRANDINA, *fēr-rân-dē'ná*: town in the s. of Italy, province of Basilicata, on a height on the right bank of the Basento, 35 m. e.s.e. of Potenza. Good wine is produced in the neighborhood. Pop. about 8,000.

FERRANDINE, n. *fēr'an-dīn*: a mixed stuff of silk and other materials. It probably resembled poplin: **ADJ.** made of ferrandine.

FERRARA, *fēr-rá'rá*: most northern of the Italian provinces washed by the Adriatic; immediately s. of the Po, between the main branch of which, and the Po di Primaro, it is for the most part inclosed. As one of the old delegations, it had 1,180 sq. m., which area is now somewhat modified. The area consists mostly of swamp and lake; and many rivers and canals intersect it. Between the Po di Volano and the Po di Primaro, the marshes become very extensive, and receive the name of *Valli di Comaccio*. This province produces great quantities of fish, affords good pastures, and has great trade in corn and hemp. It was formerly a dukedom under the House of Este, but on the failure of a legitimate male heir, Pope Clement VIII. wrested it from this family, and annexed it to the States of the Church 1598. It became part of the kingdom of Italy 1860. Its pop., as one of the old delegations, was 244,524; but according to *Statistica Administrativa del Regno d'Italia* (1861) the province as modified had pop. 194,161; (1871) 215,369; (1890) est. 246,089.

FERRARA: ancient city of Italy, cap. of the province

FERRARA.

of F.; in a low marshy plain in the delta of the Po, about 4 m. s. of the main branch of that river, 28 m. n.n.e. of Bologna, 40 m. n.w. of Ravenna. F. was first made a walled city by the exarch of Ravenna about the close of the 6th c., and in the following century (661) became the seat of a bishop. In the middle ages, it was the great commercial emporium of Italy, and the seat of a court renowned throughout Europe; but now the city has a peculiarly deserted and melancholy appearance; grass grows on the pavements of its broad and regular streets, and its churches and palaces are either rapidly falling, or have already fallen into decay. It is surrounded with walls, and is strengthened by bastions and a fortress. The old castle, or ducal palace, once the residence of the Dukes of Este, but recently, until 1860, occupied by the papal legates, rises like a huge rock, is strengthened with corner-towers, and surrounded by a ditch. Its ecclesiastical edifices, which are very numerous, and of which the churches of Santa Maria degl' Angeli and of San Benedetto are the most remarkable in architecture, are rich in paintings by the great masters of the Ferrara and Bologna schools. Besides their valuable paintings, these churches contain numerous sculptured monuments of famous persons; the church of San Francesco has a curious echo, with 16 reverberations. The university, founded 1264, was reorganized 1402, closed 1794, and reopened 1824. It is in high repute as a school of medicine and jurisprudence, and is attended by 100 to 200 students. It has an excellent library, which, besides a variety of mss., missal paintings, and old editions of printed works, contains several of the works of Tasso and Ariosto in their own hand. F. is remarkable specially for its art associations. Under the patronage of the Dukes of Este, it produced a school of painters who rank high in the history of art; while in literature the name of F. is immortalized through its connection with those of Tasso, Ariosto, and Guarini.

In 1849, the Austrians took possession of the town, but were compelled to abandon it at the commencement of the Italian campaign 1859, June. In 1860, Apr., F., with the state of which it is cap., was formally annexed to the kingdom of Italy under Victor Emmanuel.—At the period of its greatest prosperity, F. had about 100,000 inhabitants. Pop. (1881) of town, 28,814; of commune (1891) 35,000.

FERRARA, COUNCIL OF: 16th general council of the church according to Rom. Cath. authorities; convened by Eugenius IV. for the purpose of reuniting the e. and w. churches. The first session was held 1438, Jan. 10, with Nicholas Albergati presiding as cardinal legate; the second, Feb. 15, was opened by the pope in person. On Mar. 10, the Greek emperor John VI., the patriarch of Constantinople, and several eastern prelates were present, and the discussion of the doctrinal differences between the churches began the next day. The sessions were continued without any apparent results till 1439, Jan. 10, when in consequence of the outbreak of the plague the pope transferred the council to Florence, where the deliberations were prolonged

FERRARI—FERREOUS.

till 1442, April 26. The C. of F. was a continuation of the Council of Basle, which was convened 1431: see FLORENCE, COUNCIL OF.

FERRARI, *fēr-rá'rē*, GAUDENZIO: 1484–1549; b. Val-dugia, in the Milanese; from a family which followed a career of art as if by inheritance. He was a scholar of Andrea Scotto and Perugino, and the chosen associate and friend of Raphael. His creations show genius of a bold, unshackled originality. The chief characteristics of F.'s style are correct and vigorous delineation, extreme vividness and delicacy of coloring, noble grace of form and attitude, and unsurpassable art in the classic disposal of drapery. Being one of the most laborious artists of his day, he executed innumerable paintings both in *fresco* and in oil, the greater part of which are in the Lombard galleries. His most comprehensive work, the frescos at Barallo, in Piedmont, represents the Passion; the *Martyrdom of St. Catherine*, to which he owes his brightest fame, is in the Milanese collection of paintings. Andrea Solario was the chief among his scholars.

FERRATE, n. *fēr'rāt* [L. *ferrum*, iron (see FERREOUS)]; a salt formed of a base with the hypothetical ferric acid (FeO_3), or trioxide of iron (see IRON). **FERRIC**, a. *-rik*, pertaining to or derived from iron. **FERRIC OXIDE**, peroxide or sesquioxide of iron, Fe_2O_3 .

FERREIRA, *fēr-rá'e-rá*, ANTONIO: 1528–69; b. Lisbon: classic poet of Portugal. He was educated at Coimbra, where he studied the Italian and Latin authors, especially Horace, whom he almost rivalled in conciseness, but not in elegance. After holding a professorship at Coimbra, he obtained a civil appointment at the court of Lisbon. He carried to perfection the elegiac and epistolary styles, already attempted with success by Sá de Miranda; and transplanted into Portuguese literature the epithalamium, the epigram, ode, and tragedy. His *Ines de Castro* is the second regular tragedy that appeared after the revival of letters in Europe, the first being the *Sophonisba* of Trissino. It is still regarded by the Portuguese as one of the finest monuments of their literature, for its sublime pathos and the perfection of its style. The works of F. are not numerous, as his official duties left him little leisure. His expression is strong rather than sweet, and is extremely animated. His efforts after brevity, however, frequently led him to sacrifice harmony to thought. His *Poemas Lusitanos* were published first at Lisbon, 1598, and the *Todas as obras de Ferreira*, 1771. Compare Sismondi's work, *La Littérature du Midi* (Paris 1813), and Bouterwek's *Geschichte der neuern Poesie und Beredsamkeit* (12 vols. Gött. 1801–19).

FERREL: see FERRULE.

FERREOUS, a. *fēr'rē-ūs*, or **FERROUS**, a. *fēr'ūs* [L. *ferrēus*, pertaining to iron—from *ferrum*, iron]: pertaining to or consisting of iron. **FERRICYANIDE**, n. *fēr'rē-si'ān-id*, and **FERROCYANIDE OF POTASH**, *fēr'rō-si'ān-id* [Gr. *kūānōs*, dark-blue]: salts called respectively the red and yellow prussiates of potash (see FERROCYANOGEN). **FERRIFEROUS**,

FERRET.

a. *fēr-rîf'ēr-ûs* [L. *fērō*, I bear]: containing or yielding iron. FERRO, *fēr'rō*, a prefix denoting the presence of iron, FERRU'GINATED, a. -*rō-jî-nā-tēd* [L. *fērūgō*, or *ferrūginēm*, iron-rust]: having the color or properties of iron-rust. FERRU'GINOUS, a. -*nūs*, impregnated or coated with oxide of iron; chalybeate; rusty-looking. FERRUGINOUS QUARTZ, or *iron flint*, a variety of quartz forming the transition to jasper, and very hard. FERRUGINOUS SPRINGS, n. in *geol.*, springs with much more than the normal amount of iron in their composition. They have a partly milky, partly ochreous hue, where the water stagnates, and cement the loose stones to which they have access. FERRUGINOUS WATERS, natural waters containing iron: see CHALYBEATE WATERS. FERRUGO, n. *fēr-rō'gō*, a disease in plants, commonly called *rust*. FERROUS OXIDE, the rust of iron which is changed into the sesquioxide or red rust by the continual absorption of oxygen; the monoxide of iron. FERRIFEROUS ROCKS, n. in *geol.*, rocks which contain iron ore, if they do not even mainly consist of it. The bands of clay ironstone of the Carboniferous age are of this character.

FERRET, n. *fēr'rēt* [OF. *fleuret*, floret-silk—from It. *fioretto*, a little flower—from *fiore*, a flower—from L. *florem*, a flower]: in *O.E.*, spun silk, and ribbon woven from it; a kind of tape.

FERRET, n. *fēr'rēt*: in *glass manuf.*, an iron used to make the rings at the mouths of bottles, or to try the melted matter.

FERRET, n. *fēr'rēt* [It. *furuetto*; F. *furet*; Ger. *frette*, a ferret—from Prov. *fretar*; Bav. *fretten*, to move to and fro over a surface], (*Mustela furo*): animal of the weasel family (*Mustelidæ*) so nearly allied to the polecat (q.v.), that many



Ferret (*Mustela furo*).

regard it as a mere domesticated variety. It is of rather smaller size, the head and body about 14 inches long, the tail five inches and a half, the muzzle rather longer and more pointed, the head rather narrower; and the color is

FERRIC—FERRIER.

very different, being yellowish, with more or less of white in some parts, there being two kinds of hair, the longer partly white, the shorter yellow. The eyes are pink. It is much more susceptible of cold than the polecat, and requires careful protection in climates where the polecat is a hardy native. It was imported into Europe from Africa, and was well known to the Romans, being anciently employed, as it still is, in catching rabbits, for which purpose it is often sent into their burrows muzzled, or 'coped,' by means of a piece of string, to drive them out into nets. or, with a string attached to it, it is allowed to seize a rabbit in the burrows, and is then drawn out, holding it fast. The usual plan, however, is to let the F. have free range of rabbit-holes unmuzzled, the rabbits being shot as they bolt. The ferret is used in catching rats also. Attention to warmth and cleanliness is essential to the health of ferrets. They are capable of only partial domestication, acquiring a kind of familiarity with man, and submitting with quietness to his handling, but apparently never forming any very decided attachment; and they never cease to be dangerous if not carefully watched, especially where infants are within their reach. If allowed any measure of freedom, they are ready to attack poultry, and kill far more than they can devour, merely sucking the blood. They generally breed twice a year, each brood consisting of six or nine. The female sometimes devours the young ones, in which case another brood is speedily produced. To FERRET OUT, to drive out of a lurking-place; to find out or discover as a ferret does. FER'RETING, imp. FER'RETED, pp.

FERRIC, FERRICYANIDE, FERRIFEROUS, etc.: see under FERRATE and FERREOUS.

FERRIDCYANOGEN, *fēr-rīd-sī-ăn'ō-jěn*: compound organic radical which has not been isolated, but which forms with potassium a well-known compound used in the arts, called the ferridecyanide of potassium or red prussiate of potash. In the preparation of this salt, a solution of ferrocyanide of potassium is acted on by a stream of chlorine gas until the color of the liquid passes from yellow to deep red, and thereafter, on evaporation and cooling, finered crystals are obtained. The chlorine (Cl) acts on two equivalents of the ferrocyanide of potassium (twice $K_4Fe\ C_2N_{12}$), removing two equivalents of potassium (F) froming oride of potassium (KCl), while the remaining constituents combine together, and produce one equivalent of ferridecyanide of potassium ($K_6Fe_2C_{12}N_{12}$). The latter is known commercially in red crystals, readily soluble in water, and yields a fine deep *Prussian blue* (Turnbull's blue) when mingled with solution of protosulphate of iron (green vitriol), and hence is used largely in dyeing and calico-printing.

FERRIER, *fēr'ri-ēr*, JAMES F., LL.D.: metaphysician: 1808, Nov.—1864, June 11; b. Edinburgh; nephew of Susan Edmonston F. After studying at Oxford, where he took the degree B.A. 1832, he was admitted to the Scottish bar

FERRIER—FERROCYANOGEN.

1833. In 1842, he was elected to the chair of history in the Univ. of Edinburgh, and 1845 to that of moral philosophy in the Univ. of St. Andrews. He early attracted notice by some metaphysical essays in *Blackwood's Magazine*; and in 1854, he published *Institutes of Metaphysics*, in which he endeavors to construct a system of idealism in a series of propositions, demonstrated after the manner of Euclid. He afterward edited the collected works of his father-in-law, the late Prof. John Wilson of the Univ. of Edinburgh. F. died at St. Andrews.

FERRIER, SUSAN EDMONSTON: novelist: 1782-1854; b. Edinburgh; aunt of James F. F. Her father, James F., one of the principal clerks of the court of session, colleague in that office of Sir Walter Scott, was intimate with the wits and literati of his day in Edinburgh, and Miss F. had the benefit of literary society. Her first work, *Marriage* (1818) was followed by *The Inheritance* (1824), and *Destiny* (1831). These tales are characterized by genial wit, a quick sense of the ludicrous, and considerable ability in the delineation of national peculiarities. Miss F. had the esteem and friendship of Sir Walter Scott.

FERRO, *fēr'rō*, or HIERRO, *yēr'rō*: most western of the Canary Isles; formerly considered the most westerly point of the old world, and for this reason geographers at one time took it as the point of departure in reckoning longitudes, as is still done by the Germans and some others. Hence, in all probability, originated the present hemispherical division of the maps of the world, F. being taken as the boundary-line. The English, however, have adopted the meridian of Greenwich as the first meridian and in this their example is followed by the Dutch, the Americans, and in sea-charts generally. The meridian of F. is 18° 9' west of that of Greenwich: see LONGITUDE. F. has 82 sq. m.; pop. 4,400.

FERROCALCITE, *fēr-rō kāl'sīt*: in *mineral.*, a variety of calcite containing carbonate of iron, and turning brown on exposure.

FERROCOBALTITE, n. *fēr-rō-kō'bōl-tīt*: in *mineral.*, a ferriferous variety of cobaltite.

FERROCYANOGEN, *fēr-rō-sī-ăn'o-jën*: compound organic radical, generally regarded by chemists as existing in ferrocyanide of potassium, or the yellow prussiate of potash, but which has not yet been obtained in a separate state. The principal compound of F. is the ferrocyanide of potassium, prepared by heating to redness in a covered iron pot a mixture of 3 parts by weight of nitrogenized matter, such as dried blood, hoofs, parings of hides, scrapings of horn, or the flesh of old or diseased horses and other animals, 3 parts of carbonate of potash, and one part of iron filings. The carbon, nitrogen, and iron combine together, and form ferrocyanogen ($\text{FeC}_6\text{N}_6 = \text{FeCy}_6$, or Cfy), which, at the same time, unites with the potassium, and produces ferrocyanide of potassium, or yellow prussiate of potash (K_4FeCy_6 , or $\text{K}_4(\text{Cfy})$). The compound obtained from the heated F_6N iron vessel is impure, but by repeated solutions in hot water

FERROL—FERRY.

and recrystallization on cooling, the salt is obtained pure in fine large tabular crystals of a lemon-yellow color. The ferrocyanide of potassium is largely used in dyeing and calico (q. v.) printing in the production of many shades of *Prussian blue*; and when it is treated with sulphuric acid, and subjected to heat applied, hydrocyanic or prussic acid ($\text{HCN} = \text{HCy}$) distils off from the mixture. The ferrocyanide of potassium is characterised by giving no indication of the presence of iron in its radical on the application of any of the tests for iron. It gives a light-blue precipitate on the addition of a solution of proto-sulphate of iron; a dark blue precipitate with perchloride of iron; a ruddy brown precipitate with sulphate of copper; and a white precipitate with acetate of lead.

FERROL, *fēr-rōl'*: strongly fortified seaport town of Spain, in Galicia: most advantageously situated on a narrow arm of the sea, 14 m. n.e. of the town of Corunna. It was originally a fishing-town, until selected for its natural advantages as a seaport by Charles III., who erected here what was at one time the finest naval arsenal in the world, and destined it exclusively for the Spanish royal navy. The entrance to the harbor, formed by a narrow inlet from the Bay of Betanzos, admits of the approach of only one ship-of-the-line at a time, and is defended by the castles of San Felipe and Palma. The town is defended by walls and fortifications; is, on the whole, regularly built, and has several squares and pleasing alamedas or public walks. The arsenal, in which 15 ships-of-the-line could be simultaneously built, covers a great space; and though now in somewhat ruinous condition, is still the most important in Spain. F. has manufactures of hats, naval stores, hardwares; and exports corn, brandy, vinegar, and fish. Pop. (including the garrison) (1877) 23,811.

FERROTYPE, *fēr-rō-tip*: term applied by Robert Hunt, the discoverer, to some photographic processes and results, in which salts of iron act an important part. Like many of the earlier paper processes, the ferrotype is far inferior in sensibility to the more modern collodion process or Archero-type, and is on that account seldom used.

FERRUGINOUS, **FERRUGO**, etc.: see under **FERREOUS**.

FERRULE, n. *fēr'rûl*, or **FERREL**, n. *fēr'rêl* [*F. virole*, an iron ring—from mid. L. *vîrîolâ*, a little circle of metal: L. *ferrum*, iron]: a ring of metal put about the end of a staff, etc., to keep it from splitting.

FERRUM, n. *fēr'rûm*: in *chem.*, a tetrad metallic element; symbol, Fe^v ; iron.

FERRY, v. *fēr'ri* [*Icel. feria*, a passage-boat—from *fara*, to go: Ger. *fähre*, a ferry—from *fahren*, to go, to carry, allied to Lat. *fero*, I bear (see **FARE** 1)]: to carry or transport over water, as a river, a lake, etc.: N. the place or passage where boats are employed to carry over passengers. **FER'RYING**, imp. -*ing*. **FER'RIED**, pp. -*rid*. **FERRY-BOAT**, the boat in which passengers are conveyed over a ferry. **FERRY-MAN**, the boatman who attends a ferry. **FERRY-**

FERRY.

FERRYWAY, *n.* a railway the track of which is laid on the bottom of the water-course, and whose carriage has an elevated deck which supports the train.

FERRY: passage by boat across water. Common rowing-boats are often used for ferrying foot-passengers, but for horses and vehicles, a flat-bottomed barge is generally used with an inclined plane at one end, or both ends to rest upon the shore, for landing and embarking. This is either rowed or pulled across by a rope. When the current is strong, and the river of moderate width, the rope is best. The rope stretched across the river passes through rings or over pulleys attached to the barge, and the ferrymen move the barge across by pulling the rope. With a small boat, in a strong current, the ferryman rows obliquely up-stream, and the is carried directly across. Broad estuaries and streams between cities or populous towns are now traversed in many places by steam-ferry-boats, which are accommodated at the landings with bridges fastened to the shore at one end, while the other end rises or falls to correspond with the height of the boat's deck. On the Nile, a sort of raft is made of inverted earthen-pots full of air. Further, on crossing of rivers, see **FORD**—**FORDING**.

Flying-bridge is the name sometimes given to a kind of ferry-boat which is moved across a river by the action of the combined forces of the stream and the resistance of a long rope or chain made fast to a fixed buoy in the middle of the river. Such a transit appliance in the United States is known as a rope-ferry. The boat thus attached is made to take an oblique position by means of the rudder; the stream then acting against the side, tends to move it in a direction at right angles to its length, while the rope exerts a force in the direction toward the buoy. If these two forces be represented by the sides of a parallelogram, the actual course of the boat would be in the direction of the diagonal (see **COMPOSITION AND RESOLUTION OF FORCES**); but as the length of the rope remains the same, the boat must continue always at the same distance from the buoy, and therefore its course is a curve, a portion of a circle, of which the buoy is the centre, and the rope the radius. The course of the boat and the action of the two forces are strictly analogous to the path of a rising kite, and to the forces of which this path is the resultant. The border of the kite corresponds to the buoy, the wind to the tidal stream, and the tail to the rudder. Flying-bridges are used for military purposes, and the modes of adapting them to the varying circumstances of the width of rivers and the velocity of their currents, form part of military engineering. An important element in the problem, is the determination of the right point of attachment for the rope. In the case of a wide river, the rope or chain requires to be of considerably length; and must be supported by movable buoys or by small boats.

In England a F., carrying passengers for pay, may be established upon a royal grant, or a prescription; but in the United States a statutory enactment of the state on whose waters the F. is proposed to be operated

FERRY.

is essential. This authority may be exercised directly by the legislature or by a delegation of powers to courts, commissioners, or municipalities. Without such authority no one, though he may be the owner of both banks of the river, has the right to keep a public F. The franchise of a F. will, in preference, be given to the owner of the soil, but may be granted to another, and the soil of another may be condemned to the use of a F., upon just compensation, through the right of eminent domain. Such franchise is held to be an incorporeal hereditament, with descent to heirs, subjection to dower, and right of lease, sale, and assignment. A state has a right to establish a F. over a navigable river separating it from another state or even from a foreign territory, though its jurisdiction extends only to the middle of such a river; and it may also erect a new F. so near an older one as to destroy its value, unless the older franchise is protected by the terms of its grant; but an individual cannot do so without rendering himself liable to an action for damages, or a suit in equity for an injunction in favor of the first owner. The owners of a F., and tenants who may lease a F. of its owners, are common carriers in law, and liable for the safe transit of goods, persons, and animals, which they receive upon their boats. Their boats, drops, and flats must be safe and adequately guarded, for their responsibility begins the moment a person or animal comes fairly on the drop, and does not cease till after the drop at the other terminus is passed.

FERRY, *fā-rē*, JULES FRANÇOIS CAMILLE: 1832, Apr. 5—1893, Mar. 17; French statesman. He studied law, and was admitted to the bar in Paris, 1854, and connected himself with that group of young lawyers who maintained constant opposition to the empire. He became connected also with journalism, published a notable pamphlet, *La Lutte Electorale*, 1863, joined the staff of the *Temps*, 1865, and obtained wide notoriety by his attacks on Baron Hausmann's administration while rebuilding Paris 1868. In 1863 he made an unsuccessful attempt to secure election to the corps legislatif; but he was better known 1869 and succeeded. He opposed the declaration of war against Prussia, and demanded the dissolution of the corps legislatif on the ground that it no longer represented the majority in the country. At the revolution of 1870, Sep. 4, he was proclaimed a member of the govt. of the national defense; the next day he was appointed sec. to the govt., and the next was given charge of the administration of the dept. of the Seine. He repeatedly risked his life in efforts to suppress the Commune, was delegated to the central mayoralty of Paris 1870, Nov. 15, was elected a representative of the dept. of the Vosges 1871, Feb. 8, was prefect of the Seine, May—June, and minister to Greece 1872-3. In 1876, Feb. and 1877, Oct., he was elected to the chamber of deputies; 1879-80 was minister of public instruction and fine arts in Pres. Grévy's cabinet; 1880-81 was pres. of the council, and 1883-85 prime minister and minister of public instruction. During his tenure of the ministry of public instruction he created

FERRY—FERTILIZERS.

profound excitement through France by his efforts to exclude Jesuit teachers from the schools. See EDUCATION, *State Education in France*. The expenses and disasters of the Tonquin expedition rendered F. exceedingly unpopular and forced his retirement 1885. In 1890 he was again elected senator, and 1893, Feb. 24, was elected pres. of the senate. He was one of the few distinguished French politicians untouched by the Panama scandal.

FERRY, *fēr'ī*, THOMAS WHITE: legislator: b. Mackinaw, Mich., 1827, June 1. He received a public-school education and engaged in the lumber business in Grand Haven. In 1850 he was elected to the state legislature, 1856 to the state senate; 1860 was vice-pres. for Mich. of the national republican convention; 1864-71, member of congress; 1871-83, U. S. senator; 1875, Nov. 22-1877, Mar. 4, acting vice-pres. of the United States; and 1883-86, travelled extensively in Europe and the East. He was elected pres. pro tem. of the U. S. senate several times, and presided over the impeachment trial of Gen. Belknap, sec. of war, and the joint electoral meetings of congress 1876-7. He d. 1896, Oct. 14.

FERSEN, *fēr'zēn*, AXEL, Count von: 1750-1810, June 20; soldier; b. Stockholm, Sweden. He entered the army of Sweden at an early age, was appointed col. of the Swedish body-guard of King Louis XVI. of France, and accompanied the French forces under Rochambeau to the U. S. After Cornwallis's surrender he received the insignia of the order of the Cincinnati from Washington, and returned to France, and endeavored to aid the royal family. Returning to Sweden he became chancellor of Upsala Univ., and grand marshal of the kingdom, and was murdered by a mob who charged him with complicity in the sudden death of Crown Prince Christian, which charge was afterward proved groundless.

FERTILE, a. *fēr'til* or *fēr'tīl* [F. and It. *fertile*—from L. *fertilēm*, fruitful—from *fērō*, I produce]: producing fruit in abundance; productive; fruitful. FER'TILELY, ad. *-lī*. FERTILITY, n. *fēr-tīl'ī-tī*, fruitfulness; richness. FERTILIZE, v. *fēr'tīl-īz*, to render productive or fruitful; to enrich. FER'TILIZING, imp.: ADJ. enriching; rendering fertile. FER'TILIZED, pp. *-īzd*, impregnated. FER'TILIZER, n. *-zēr*, that which enriches; a rich manure (see GUANO: MANURES: PHOSPHATES). FER'TILIZA'TION, n. *-ī-zē'shūn* [F.—L.]: the act of making fruitful. FERTILIZATION OF PLANTS: see FECUNDATION.—SYN. of 'fertile': fruitful; abundant; productive; rich; inventive.

FERTILITY OF SOILS: see SOILS.

FERTILIZERS: substances which increase the productiveness of soils and promote the growth of plants. The term is specifically used to designate the concentrated chemical F. which are articles of commerce while manure (q.v.), is used to indicate animal excrement, compost, and other fertilizing material obtained on the farm. While manures have been employed in agriculture from very early times the introduction of commercial F. is recent. The necessity for their use has arisen from the lessened

FERULE.

fertility of the soil caused by the removal of many successive crops. The quantity of manure supplied by the farms has proved insufficient and diminished yields have attended the gradual impoverishment of the land. Commercial F. are designed to supplement rather than supplant farm-yard manures, and for this purpose they have proved invaluable. They allow the farmer to return to the land the elements of fertility which have been abstracted by continued cropping and at the same time supply an abundance of plant food in an immediately available condition. Their introduction has led to a much improved system of farming. Though bones, fish, and even superphosphate of lime had been previously employed to a very limited extent, the use of commercial F. may be said to date from 1840, in which year the first cargo of Peruvian guano was shipped to Europe. During the same year Liebig published his celebrated work on *Organic Chemistry* in which he pointed out the necessity of supplying to the soil the mineral constituents of plants which until then had been regarded as unimportant. Since that time the use of F. containing mineral matters has come to be regarded as essential to the highest success in farming.

The principal elements of commercial F. are nitrogen, phosphoric acid, and potash. These elements are essential to the growth of plants and are likely to be deficient in soils which have been long under cultivation. Nitrogen (q.v.) for use in the manufacture of F. is obtained from sulphate of ammonia (one of the products of gas manufacture); nitrate of soda, vast deposits of which are found in Chili; dried blood and other refuse from slaughter-houses; fish guano (the refuse after the oil has been extracted from fish), and Peruvian guano (see GUANO) from islands on the coast of Peru. The two latter materials yield phosphoric acid and potash as well as nitrogen, and the slaughter-house refuse gives a small quantity of phosphoric acid. Bones; bone ash (bones from the great plains of S. America, burned in the open air); Canadian apatite; S. Car. phosphate rock, and Peruvian guano supply phosphoric acid (q.v.). Potash (q.v.) is obtained from wood ashes and saltpetre, but principally from immense mines of potash salts near Stassfurt, Germany. Various grades of these salts are known as sulphate of potash, muriate of potash, and kainit. Complete F. contain nitrogen, phosphoric acid, and potash. Special F. also are manufactured which contain these elements in proportions varying according to the needs of the particular crops to which they are to be applied. The quantity to be used for farm crops ranges from 200 to 2,000 pounds per acre. It is applied either broadcast or in hills or drills. Used with manures or alone F. act promptly and certainly, give the plants an early and vigorous start, promote rapid development, hasten maturity, increase the yield, and in a marked degree improve the quality of the product. Vast quantities are used annually by farmers and market gardeners throughout the older settled portions of the country.

FERULE, n. fěr'ul, or FERULA, n. fěr'ū-lă [L. fěrŭla;

FERULIC ACID—FESCH.

F. *férule*, a rod, a cane]: a rod or flat stick for inflicting punishment in a school.

FERULIC ACID, n. *fě-ról'ik*- [L. *ferula*, derived from plants of the genus *Ferula*]: acid existing in asafetida, extracted by precipitating the alcoholic solution with lead acetate, and decomposing the precipitate with dilute sulphuric acid. There are other methods.

FERVENT, a. *fě'r'vent* [F. *fervent*—from L. *fervēn'tēm*, boiling hot, burning; It. *fervente*]: boiling; hot; earnest; ardent; vehement. **FER'VENTLY**, ad. *-lĭ*, eagerly; vehemently; with holy zeal. **FERVENTNESS**, n. *-nēs*, fervency; fervor; ardor; zeal. **FER'VENCY**, n. *-vēn-sĭ*, ardor; eagerness; warmth of devotion. **FER'VID**, a. *-vĭd*, very hot; eager; zealous; glowing. **FER'VIDLY**, ad. *-lĭ*. **FER'VIDNESS**, n. **FER'VOR**, n. *-vēr*, heat of mind; zeal; ardor; earnestness.

FESA, *fě'sā* or *fā'sā*, or **FASA**, *faw'sa*: town of Persia, province of Fars, 80 m. s.e. of Shiraz, in a mountain defile. It has manufactures of silken, woolen, and cotton fabrics, and some trade in a superior kind of tobacco grown in the vicinity. Pop. said to be 18,000.

FESAPO, n. *fě-sā'pō* [mnemonic word]: in *logic*, the fourth form of the fourth figure of syllogisms, in which the middle is the predicate of the major premise, and the subject of the minor consists of a universal negative, a universal affirmative, and a particular negative. Example: FE, No A is B. SA, All B is C. PO, Some C is not A.

FESCENNINE, a. *fěs'sēn-nĭn* [from *Fescennium*, town of Etruria]: of or pertaining to Fescennium; licentious; lewd; obscene; scurrilous: N. a licentious, obscene, or scur; rilous song, like the Fescennine verses (q.v.) of ancient Italy.

FESCENNINE VERSES, *fěs'sēn-nĭn*: forming a department of the indigenous poetry of ancient Italy; a sort of dialogues in rude extempore verses, generally in Saturnian measure, in which the parties rallied and ridiculed one another. It formed a favorite amusement of the country-people on festive occasions, especially at the conclusion of harvest and at weddings. As was to be expected, it often degenerated into licentiousness, that at last required the curb of the law. The F. V. are usually considered of Etruscan origin, and to have derived their name from the Etrurian town Fescennium; but there is little probability in this etymology. Verses of this sort were and still are popular all over Italy. The name is more likely connected with *fascinum*, fascination, enchantment, or the evil eye, against which the chanting of verses may have originally been intended as a protection.

FESCH, *fěsh*, **JOSEPH**, Cardinal and Archbishop of Lyon: 1763, Jan. 3—1839, May 13; b. Ajaccio. His father, a Swiss officer in the service of Genoa, had married a widow, whose daughter by a former husband, Letizia or Lætitia Ramolino, became the mother of Napoleon Bonaparte. F. was thus half-brother of Letizia, and uncle of the future

FESCUE.

emperor. He had entered the clerical profession, but left it at the outbreak of the French Revolution, and, 1795, became commissary to the Army of the Alps under his nephew in Italy. The First Consul having resolved on the restoration of the Rom. Cath. worship, F. resumed the clerical habit, and was active in bringing about the concordat with Pope Pius VII. 1801. He was 1802 raised to be abp. of Lyon, and in the following year to be cardinal. In 1804, he was sent as French ambassador to Rome, where he ingratiated himself with the pope by his adroit management and ultramontane sentiments, and contributed to induce the pope to undertake his mission to Paris to consecrate Napoleon as emperor. F. accompanied the pope, and assisted at the coronation; and for his services at Rome he was rewarded by the office of grand almoner and a seat in the senate. In 1806, the abp. of Regensburg, arch-chancellor and first prince elector of the just expiring German Empire, and about to become the prince primate of the nascent Confederation of the Rhine, chose F. his coadjutor and successor; and, with all these dignities, he received a stipend of 150,000 florins a year. In 1809, Napoleon wished to invest him with the Archbishopric of Paris, but F. declined it, as he had long been dissatisfied with the emperor's policy in regard to the papal chair. In 1810, he presided at a national conference of clergy assembled at Paris, and the views which he maintained there, with even more than usual keenness brought him into disgrace with the emperor, who was still further exasperated against him on account of a letter which F. wrote to the pope, then (1812) in captivity at Fontainebleau, and which was intercepted. He lost his imperial dignities and pension and after this lived in a sort of banishment at his bishopric of Lyon. At the approach of the Austrians 1814, he fled to Rome with his sister Letizia, mother of the emperor, where he was received with open arms by the pope. The return of Napoleon brought him back to France, and during the Hundred Days, he was nominated a member of the chamber of peers, though he never took his seat; but, after the battle of Waterloo, he had again to take refuge in Italy. The royalist clergy then persecuted him with accusations and lampoons which he in no way deserved. His resistance to the will of his nephew seems to have been actuated by zeal for what he considered to be the interests of the church. When called upon by the Bourbons to resign his episcopal office, he obstinately refused; and it was not till 1825, after receiving a papal brief interdicting the exercise of his clerical functions, that he resigned the charge but not the title. In 1837, an attempt was made to reinstate him, to which, however, the French government refused assent. He lived in the greatest friendship with his sister, Madame Mère as she was styled, till his death. Of his famous and very large collection of paintings, he bequeathed a part to the city of Lyon, and the rest was disposed of in a series of auctions at Rome after his death.

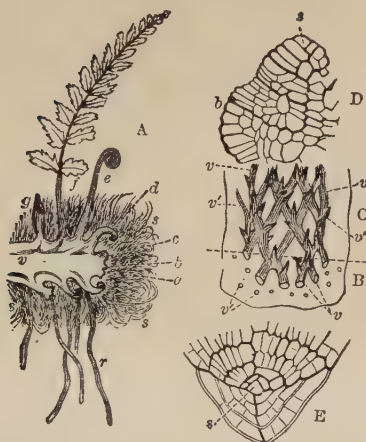
FESCUE, n. *fēs'kū* [F. *fētu*; OF. *festu*, a straw: L. *festūcā*, a young shoot or stalk on a tree]: a small pointer; in *bot.*, a sharp-pointed coarse kind of grass.

FESCUE.

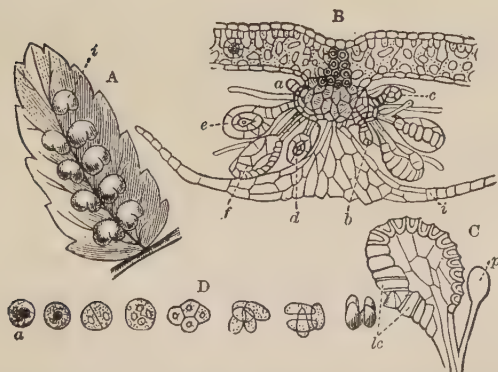
FESCUE (*Festuca*): genus of grasses of the ord. *Gramineæ*, very nearly allied to Brome-grass (q.v.), having in some species a loose, in some a contracted panicle; the spikelets many-flowered, with two unequal glumes, which they much exceed in length; each floret having two lanceolate paleæ, the outer paleæ rounded at the back, and acuminate or awned at the summit; the stigmas growing from the apex of the germen. The species are numerous, and very widely diffused over the world, in both the n. and the s. hemispheres. Among them are many of the most valuable pasture and fodder grasses. — **MEADOW F.** (*F. pratensis*), a species with spreading panicle and linear spikelets, two to three ft. high, common in moist meadows and pastures of rich soil, in Britain and throughout Europe, in n. Asia, and in parts of N. America, is perhaps excelled by no meadow or pasture grass whatever. It is suitable both for alternate husbandry and for permanent pasture. — **SPIKED F.** (*F. loliacea*)—by many botanists regarded as a variety of Meadow F., though it departs from the habit of the genus in having the branches of the panicle reduced to a single spikelet, and forming a two-rowed raceme or spike—is regarded as an excellent grass for rich moist meadows. — **HARD F.** (*F. duriuscula*), a grass 18 inches to two ft. high, with a somewhat contracted panicle, mostly on one side, is one of the best grasses for lawns and sheep pastures, particularly on dry or sandy soils. Several varieties are known to seedsmen and farmers — **CREeping F.** or **RED F.** (*F. rubra*) is probably a mere variety of Hard F., distinguished chiefly by its extensively creeping roots which particularly adapt it to sandy pastures, and to places liable to inundations. — **SHEEP'S F.** (*F. ovina*) is a smaller grass than any of these, not generally exceeding 12 inches in height, and often much less, abundant in mountainous pastures, and especially suitable for such situations, in which it often is the principal food of sheep for many months of the year. It is common in all the mountainous parts of Europe, and in the Himalaya, it is also a native of North America, and species very similar, if not



Fescue Grass (*Festuca pratensis*):
a, germen and stigmas; b, a spikelet.



Ferns.—A, Section along rhizome of *Aspidium*, showing vascular bundles, *v*; stages of leaf development from apical buds to dead leaf-stalk, *a-g*; scale hairs, *s*; and roots, *r*. B, Transverse section of fern-rhizome, showing outside the smaller bundles, *v'*; passing out to the leaves and main bundles, *v*. The anastomosing of these, forming the netted cylinder, is shown in elevation in C. D, Tip of developing leaf of *Ceratopteris*: *s*, Apical cell; *b*, Lateral lobe of leaf. E, Longitudinal section of root-tip of *Pteris*: *s*, Apical cell, developing root-cap below.



Ferns.—A, Under-side of a leaflet of *Aspidium filix-mas*, with sori, *i*. B, Transverse section, with a sorus consisting of the sporangia in different stages of development, *a-f*, and the indusium, *i*. C, Sporangium, with annular lip-cells, *lc*, and paraphysis, *p*. D, Development of spores from mother-cell, *a*.

FESELS—FESSLER.

mere varieties, abound in the s. hemisphere. Its habit of growth is much tufted. TALL F. (*F. elatior*) is a grass of very different appearance, four or five ft. high, with spreading much-branched panicle, growing chiefly near rivers and in moist low grounds, and yielding a great quantity of herbage, which, through coarse, is relished by cattle.—*F. heterophylla* is a tall species with narrow root-leaves, and broad leaves on the culm; native of France and other parts of the continent of Europe, and extensively cultivated in the Netherlands.—All these species are perennial.—Some small annual species occasionally form a considerable part of the pasture in dry sandy soils, but are never sown by the farmer. A Peruvian species (*F. quadridentata*), called *Pigouil* in its native country, and there used for thatch, is said to be poisonous to cattle.

FESELS, n. *fès'èls* [*F. faséoles*—from *L. phaseolus*; Gr. *phasēlos*, a sort of kidney-bean]: in *bot.*, a kind of kidney-bean or French bean.

FESSE, or FESS, n. *fès* [*L. fasciā*, a band: OF. *fesse*]: in *her.*, lines or a broad band crossing the shield horizontally, and containing the third part of it, between the honor point and the nombril. It is one of the honorable ordinaries, and is supposed to represent the waist-belt or girdle of honor, which was one of the insignia of knighthood. PARTY PER FESS, said of a shield, or charge in a shield, when it is horizontally divided through the middle, or, as the French say, *coupé*. FESSWISE, said of a charge placed *in fess*; that is to say, horizontally across the shield.

FESSENDEN, *fès'en-dén*, WILLIAM PITT, LL.D.: statesman: 1806, Oct. 16—1869, Sep. 8; b. Boscawen, N. H.; son of Samuel F., LL.D., lawyer and maj.gen. of Mass. militia. He graduated at Bowdoin College 1823, was admitted to the bar 1827, began practicing in Bridgeton, Me., and settled permanently in Portland. In 1832 he was elected to the legislature as a whig, and became noted as a legislator and debater. He declined nominations to congress 1831 and 38, practiced law 1832-39, was returned to the legislature 1840 and served as chairman of the committee to revise the state statutes, was a member of congress 1841-43, was defeated for the U. S. senate 1843, was re-elected to the legislature 1845, 46, 53, and was elected U. S. senator as a whig by a democratic legislature in the latter year. He was appointed a member of the finance committee, and on his re-election 1859 became its chairman, and served as such through the war. On the resignation of Sec. Chase of the U. S. treasury dept., 1864, F. was appointed his successor, and held the office till 1865, Mar., when he resigned from ill health, and resumed his seat in the senate on a re-election. His greatest financial feat was the floating of the 7-30 bonds. He was a regent of the Smithsonian Institution, and received the degree LL.D. from Bowdoin College 1858 and Harvard Univ. 1864. As financier he was both judicious and brilliant; and his personal character commanded universal respect.

FESSLER, *fès'ler*, IGNAZ. AURELIUS: Hungarian his-

FESTAL—FESTIVAL PLAYS.

torian: 1756–1839, Dec. 15; b. in the county of Soprony or Oedenburg. During a long life full of adventures, F. served successively Emperor Joseph II., the king of Prussia, and the emperor of Russia; and was prof. of oriental languages at different universities. He died at St. Petersburg. Among his works of lasting value are—*Attila* (Breslau 1794), *Mathias Corvinus* (2 vols. 1793; 2d ed. 1806 Breslau), and the History of the Hungarians, etc. (*Geschichte der Ungarn und deren Landsassen*, 10 vols, Leip. 1812–25). His autobiography, *Recollections of my 70 Years' Pilgrimage* (*Rückblicke auf meine 70 jährige Pilgerschaft*, Breslau 1826; 2d ed. Leip. 1851), is a very interesting work. Deep learning and rare beauty of style, render attractive F.'s works (all in German).

FESTAL, a. *fēs tāl* [L. *festivus*, festive—from *festum*, a festival, see **FAST**; but according to some, fr. Gr. *hestia*, hearth]: pertaining to a feast; joyous; mirthful. **FES'TALLY**, ad. *-lī*. **EES'TIVAL**, n. *-tī-vāl* [F.—L.]: the time of feasting; an annual rejoicing; a holy-day, as church festivals. **ADJ.** of or pertaining to a feast or day of rejoicing. **FES'TIVE**, a. *-tīv*, pertaining to a feast; joyous. **FESTIVELY**, ad. *-lī*. **FESTIVITY**, n. *fēs-tīv'ī-tī*, the mirth at a feast; gayety; social joy at an entertainment.—**SYN.** of 'festival': festivity; feast; banquet; carousal; celebration.

FESTER, v. *fēs'tēr* [Walloon, *s'efister*, to corrupt: Low Ger. *fistrig*, fusty, ill-smelling: comp. Gael. *fiadhair*, angry, inflamed]: to corrupt; to rankle; to gather matter, as a sore; to suppurate. **N.** a sore which discharges corrupt matter. **FESTERING**, imp.: **ADJ.** rankling; growing more corrupt. **FESTERED**, pp. *-tērd*.

FESTINATE, a. *fēs'tī-nāt* [L. *festinātus*, hastened, quickened]: in *OE.*, hasty; hurried. **FES'TINATELY**, ad. *-lī*, with speed; hastily.

FESTINO, n. *fēs-tī'nō* [mnemonic word]: in *logic*, the third form of the second figure in which the middle term is the predicate of both premises. It consists of a universal negative, a particular affirmative, and a particular negative. Example: **FES**, No **A** is **B**. **TI**, Some **C** is **B**. **NO**, Some **C** is not **A**.

FESTIVAL, **FESTIVITY**: see under **FESTAL**.

FESTIVAL PLAYS: see **MORALITIES**: **MIRACLE PLAYS** **MYSTERIES**.

FESTIVALS.

FESTIVALS, or FEASTS: certain periodically recurring days and seasons set aside by a community for rest from the ordinary labor of life, and more or less hallowed by religious solemnities. Originating within the narrow circle of the family, and commemorating momentous events affecting one member or all, these pauses became more frequent, and of wider scope, as the house gradually expanded into a tribe, a people, a state. The real or imaginary founders, legislators, heroes, became objects of veneration and deification, and the salient epochs of their lives the consecrated epochs of the year. National calamities or triumphs were, in the absence of annals, remembered by corresponding general days of humiliation or exultation. Earliest of all, however, did the marked stages in the march of nature: spring and autumn, seed-time and harvest-time—symbols of life and death; the solstice—turning-points of summer and winter; the new moon and the full moon; the termination of cycles of moons and cycles of years, present themselves as opportune halting-places for man himself. No less were the all-important periodical rises of fertilizing rivers, and the anniversaries of importations and inventions of new implements for the better cultivation of the soil, or tending of the flocks, befittingly celebrated. The inherent human tendency toward referring all things of graver import, life and death, abundance and want, victory and defeat, to a higher power, could not but infuse a religious feeling into epochs so marked. Fostered and guided by priests and lawgivers, this property of our nature ere long found its expression in common sacrifices, prayers, and ceremonies, consecrated to the various superior and minor deities who, it was thought, presided over and inhabited the elements of the visible and invisible creation, and who, working all the changes within them, acted each in its sphere, as a partial providence over man. According to the event which called them forth, these festivals were mournful or joyous, jubilant or expiatory. Even when sorrow was to be expressed, the mortification of the body did not always suffice, but plays, songs, dances, and processions full of boisterous mirth, were resorted to—as in the festivals of Isis at Busiris, of Mars at Papremis, in the Adonia of Egypt, Phœnicia, and Greece—because the divine wrath or sorrow was, like that of man, to be changed into satisfaction. Besides the relation between the common tutelary deity and those whom he protected, the bond also by which the otherwise disconnected members of the body-politic were held together was, by means of these festive gatherings, periodically brought in view, and invested with strength and importance. Apart, however, from this their historical, astronomical, religious, and political end, festivals served another purpose—that of growing civilization. It was the glowing spirit of emulation which, stimulating the gifted in mind and body to strive for the festive laurel in contests of genius and skill, in honor of the gods, and in the face of all the people, matured all that was noble and brilliant within the community. Archaic rudeness and rustic extravagance became refined grace and classic harmony. The stirring

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drama, the glorious anthem, the melodious dance, the elegant game, which accompanied the festive sacrifice of some nations at their highest stage of development, had arisen out of those very mimicries and shouts, rude and savage beyond expression, of generations not long preceding. Enthusiastic, wild, metaphysical Egypt invested the countless days consecrated to her deified stars, plants, animals, and ideas—to the Nile, to Ammon, Kneph, Menes, Osiris; to Horus, to Neitha, to Ptah—with a mystery; sensuality, and mournfulness always exaggerated, sometimes monstrous. The Hindu, no longer daring to offer human sacrifices, shows his odd and cruel materialism by throwing into the waves, on his festival of rivers, some of his costliest goods, gold, jewels, garments, and instruments; while in the licentiousness and debaucheries perpetrated on the festival of Shiva, the god of procreation, or on the Bacchantics of the goddess Bhavani, he exceeds even those of the Egyptians on their Neitha feasts at Bubastis, and the Greek worship of Venus in her Cyprian groves. Phœnicians and Assyrians, Babylonians and Phrygians, according to the little we know of their religions and manners, appear to have feasted, thanked, propitiated, mourned all at different times, and in the way most befitting their several natures, even in the case of those gods and festivals which they had in common.

The ancient Persians alone of all nations had no festivals, as they had no temples and no common worship. These 'Puritans of Polytheism,' who worshipped the sun only, and his representative on earth, fire, scorned show and pomp, and large religious gatherings. A striking contrast to them is formed, in another hemisphere, by the ancient Mexicans, who were found to possess one of the most richly developed calendars of festivals, scientifically divided into movable and immovable feasts. A strange and singular phenomenon among festivals, is that 'of the Dead or Souls,' celebrated among the wild tribes of N. America. At a certain time, all the graves are emptied, and the remains of the bodies buried since the last festival are taken out by the relatives, and thrown together into a large common mound, amid great rejoicings and solemnities, to which all the neighboring tribes are invited.

Greece had received the types of civilization, religion, and art from Egypt and the East generally, but she developed them all in a manner befitting her glorious clime and the joyous genius of her sons. At the time of the *Iliad*, two principal festivals only—the harvest and the vintage—seem to have been celebrated (ix. 250); but they increased with such rapidity, that in the days of Pericles they had reached, the number of a thousand; some indeed being an epitome only of their memorable feats of arms, others restricted to one town, or province, or profession, or sex, or to a few initiated, or recurring only at intervals of several years; but there were so many kept by the whole people, that ancient writers bitterly denounce them as merry beginnings of a sad end, as the slow but sure ruin of the commonwealth. Their forebodings proved true; yet Greece would certainly

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never have reached the highest place among nations, as far as literature, the arts, and philosophy are concerned, had it not been for the constant contests attached to her many festivals. She resisted Asia, because her citizens were always alert, always ready. The religious part of the festival—homage offered to personified ideas—consisted mostly in carrying about of the deity of the day to the sound of flute, lyre, and hymns, and in a sacrifice, followed by a general meal upon certain portions of the animal offered. Then followed scenic representations symbolizing the deeds of the gods; after which came games and matches of all kinds—foot, horse, and chariot races, leaping, boxing, throwing, wrestling, etc. (For separate accounts of the more remarkable Greek festivals, see BACCHUS: ELEUSINIAN MYSTERIES: PANATHENÆA: ETC.) There were also special times set aside for the 'Holy Games' proper. The most important of these were the Olympian, the Pythian, the Nemean, and the Isthmian. (See these titles.) As all these festivities were provided out of the public purse—from the confiscated estates of the 'tyrants' and political delinquents—the individual did not suffer more than a welcome interruption of his usual business, and under that genial sky the penalty to be paid for occasional indolence was not too heavy.

Rome, having been founded amid pastoral festivities in honor of some god Pales, adopted and acclimatized, as she went on from conquest to conquest, the foreign deities, exactly as, with her usual prudence and practical sense, she conferred her right of citizenship on her foreign inhabitants, and on the whole nations subjected to her rule. Her yoke was thus less galling to the new provinces, while the populace at home found sufficient distraction in the many ancient and newly imported festivals, with their quaint rites and gorgeous pageantry. Yet the Romans—more parsimonious and abstract by nature than the vivacious Greek neighbors from whom they had accepted the greatest part of their religion—never exceeded in their festivals the number of one hundred, and in these, again, a distinct line was drawn between civil and religious ones. Some of the principal religious festivals were the Sementinae, Jan. 25—the rural festival of the seed-time; the Lupercalia, in honor of Pan; the Cerealia; the night festival of the Bona Dea; Matronalia; Minervalia; etc. To the purely civil ones belong the Januaria—Jan. 1, the new-year's day, when the new consuls entered upon their office, and friends used to send presents (*strenæ*) to each other; the Quirinalia, in memory of Romulus, deified under the name of Quirinus; and the Saturnalia, in remembrance of the golden age of Saturn, beginning Dec. 19. The celebration of these festivals was in all respects imitated from the Greeks, with this difference only, that the games connected with them became, with the pre-eminently bellicose Romans, terribly lifelike images of war. Their sham sea-fights; their pitched battles between horse and foot, between wild beasts and men; their so-called Trojan games, executed by the flower of the nobility; their boxing-matches (with gloves that had lead and iron sewed into them): circus, arena, and amphitheatre.

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theatre gave, especially in later times, the greater satisfaction the greater the number of victims.

It is one thing only that monotheism has in common with polytheism with respect to its festivals—namely, that they are with each the religious expression of human joy or human sorrow or human hope. But polytheism, with a dim misgiving of some awful and supreme power, invited the multifarious governors of the many provinces of nature to partake, as guests, of bodily and intellectual feasts, *together* with their hosts; whereas monotheism, binding up all fear and all hope, all gratitude and all awe, which moved the heart of man, in one almighty Creator, Mover, and Maintainer of all things, celebrated its festivals in honor of this omnipresent Spirit with a veneration, a purity, and a lofty elevation, such as the worshippers of star, animal or image never knew. With the first and strictest monotheists, the Hebrews, whose very existence as a nation was traced to the special and miraculous interference of this only living God, the remembrance of that great event, their liberation from Egypt, and the momentous period of preparation in the desert which followed it, mingled with almost all their religious observances, and especially their festivals, and infused into them all a tone of gratitude; while it held ever before their eyes the cause of their nationality, and their aim and destiny 'to be a kingdom of priests and a holy people.' The Hebrew festivals, too, are of a historical, agricultural, astronomical, and political nature; but they mostly combine all these characteristics, and are always hallowed by the same religious idea, and the same piety and devotion to one and the same holy name. Connected with their festivals were no plays and no representations of a god's deeds, no games and no cruelty, no mystery and no sensuality, but the sacrifice of the day, and a special occupation with the divine law, were the visible signs of the exalted seasons. The influence of the number seven—an influence notable among most eastern nations—is seen in the recurrence of many of the Jewish solemnities: see SEVEN. The sabbath (q.v.), was first and most important of these septenary festivals, concerning the service in the temple, and the mode of observing this and the other festivals since the destruction of the temple, see HEBREWS JEWS. The most exalted of new-moon festivals was that of the first day of the seventh month, 'the day of remembrance of the sounding' or 'of trumpets' (Lev. xxiii. 24), to which in later times, when the Seleucidian era was introduced (the Syrian year beginning with the autumnal equinox), the name of Rosh hashana (New Year) was given; notwithstanding that in Ex. xii. 2, Nisan is spoken of as the first month of the year. After a period of six years of labor, the earth, too, was to celebrate a Sabbath-year; what it produced spontaneously belonged to the poor, the stranger, and to animals. It is remarkable that even Alexander the Great and Cæsar remitted the taxes of Judea in this year of *Shemitta* (abandoning). After a revolution of seven times seven years, the year of Jubilee or *Jobel* was to be celebrated, in which all the Hebrew slaves

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were set free, and all land which had been sold in the interval was restored to the former owners, in order that the original equilibrium in the families and tribes should be maintained intact. (These two epochs however, were, according to the Talmud, not kept, as festivals before the Babylonian captivity.) The pre-eminently agronomical and historical festivals were the three *Chaggin* (whence the Arab. *Hagg*, a pilgrim to Mecca)—viz., *pesach* (Passover), *Schabuoth* (Feast of Weeks), and *Succoth* (Feast of Tabernacles); on which three every man of proper age was obliged to go up to Jerusalem and offer some of the first fruits, besides the prescribed sacrifices (see PASSOVER: ETC. —For the postmosaic and exclusively historical festivals, *Purim*, the feast of Haman, *Chanuca*, the feast of the *Macabees*, see JEWS.

The Christian festivals (see their several titles) were for the most part grafted, in the course of time, upon the Jewish and Pagan ones, but always with a distinct reference to Christ and other holy personages. The weekly day of rest was transferred from Saturday to the first day of the week, and called the day of joy, or Resurrection, as the weekly Jewish fasts of Monday and Thursday were changed for Wednesday and Friday: see FASTS. For a long time, both the Sabbath (Saturday) and the Lord's Day (Sunday) were celebrated, especially in the East. Two separate celebrations took the place of the Jewish Passover: the *Pascha Staurosimon* was the festival of the Death, the *Pascha Anas-tasimon* of the Resurrection of our Lord (see EASTER); and the festival of Pentecost, or the law-giving at Sinai, became the festival of the outpouring of the Holy Spirit and of the inauguration of the New Covenant and the Christian Church. In the 4th c., two new festivals were introduced: Epiphany (q.v.), which originated in the East; and the Nativity or Christmas (q.v.). Circumcision, Corpus Domini, the festivals of the Cross, of Transfiguration, of the Trinity, and many others, are of still later date. The veneration felt for the Virgin Mary as the Mother of our Lord found its expression likewise in the consecration of many days to her special service and worship; such as that of her Presentation, Annunciation (Lady's Day) Assumption, Visitation, Immaculate Conception (q.v.), and many minor festivals, besides the Saturdays, which in some parts were entirely dedicated to her, in order that the Mother might have her weekly day like the Son. Besides these, there were festivals of Angels, of Apostles, Saints, Martyrs (on the supposed anniversary of their death, called their birthday, *dies natalis*), of Souls, Ordinations, etc.

Celebrated at first with all the primitive simplicity of genuine piety, most of these festivals were ere long invested with such pomp and splendor that they surpassed those of the ancient Greeks and Romans. Burlesque, even coarse and profane representations, processions, mysteries, and night-services, were, in some places, though unauthorized by the general church, connected with them, and voices within the church loudly denounced these 'pagan practices.' Ordinances forbidding mundane music and

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female singers for divine service were issued, the vigils were transformed into fasts, days of abstinence and penance were instituted, partly as counterpoises, but with little result. Nor did the prodigious increase of these festive occasions, and the rigor with which abstinence from labor was enforced in most cases, fail to produce the natural results of indolence and licentiousness among the large mass of the people. Bitter and frequent were the complaints throughout Christendom; but though even men like Abp. Simon of Canterbury (1332), Petrus de Alliaco, Nicolaus of Clemangis, did their utmost to obtain a reduction of these festive occasions, which overspread well-nigh the whole year, it was only after the most decided and threatening demands, such as that pronounced by the German Diet of Nürnberg 1522, that Pope Urban was prevailed upon to reduce the number for Rom. Cath. Christianity (1642). Benedict XIV. (1742), Clement XIV. (1773), followed in the same direction. The reformation wrought a change both in their number and in the manner of their celebration.

The Christian festivals have been divided variously: into *feriæ statutz* (returning annually at fixed times), *indictæ* (extraordinary, specially proclaimed), *duplicita* (double reminiscence, or of higher importance), *semiduplicita* (half double), etc. Another division is into weekly and yearly feasts, these latter being subdivided into greater and minor, or into movable and immovable. There is also a distinction made between *integri* (whole days), *intercisi* (half-days), etc. Beside the church festivals, there are also in some countries, civil days of annual religious observance (Thanksgiving Day, Fast Day), commended to all the people by proclamation from the civil power. The only trace of the ancient manner of dating a festival from the eve or vesper of the previous day—a practice discontinued since the 12th c., when the old Roman way of counting the day from midnight to midnight was reintroduced—survives in some regions in the 'ringing in' of certain days of special solemnity on the night before, and in the fasts of the vigils.

On some of the principal Mohammedan festivals, based partly on those of the Jews and Christians, such as the weekly Friday, the Yom Ashoorá (Jewish Day of Atonement), the Birthday of the Prophet (Molid An-Nebee), that of Hussein, of Mohammed's granddaughter Zeyneb, of the Night of the Prophet's Ascension to Heaven (Leylet Al-Mearag), the Night of the Middle of the Month Shaabán, in which the fate of every man is confirmed for the ensuing year; the Eed Al-Shagheer or Ramadan-Beyram, at the end of the Ramadan fasts, and the Eed Al-Kabir, or the great festival of the Sacrifice (Kurban Beyram), see MOHAMMEDANISM. For further information, see Herodotus (ii. 60); Plutarch (vii.); Strabo (vi. and x.); Ovid, *Fasti*; Macrobius, *Sat.* i. 7, 11; Meursius, *Græcia Fériata*; Meiners, *Geschichte d. Relig.*; Fasold, *Ierologia*; Bible; Mishna; Gemara; Shulchan Aruch; Josephus; Philo; Maimonides; Buxtorf, *Lex. Talm.*; *Synag. Jud.*;

FESTOON—FESTUS.

Bartolucci, *Bibl. Rabb.*; Lightfoot, *Hor. Hebr. and Talm.*; Lund, *Bibl. Hebr.*; Wette, *Archæologie*; Neander, *Hist. of the Ch.*; Blackmore, *Christ. Antiq.*; Baumgarten, *Erläuterung d. chr. Alterth.*; Siegel, *Handb. d. chr. Alterth.*; Mai, *Discorsi di Argomento Religioso*; Koran, etc.

FESTOON, n. *fēs-tôn'* [F. *feston*—from It. *festone*, a garland—from mid. L. *festōnem*: probably connected with mid. L. *festis*; OF. *fest* and *faiste*; F. *faîte*, a top, a ridge]: a chain or string of a number of things hanging downwards in a curved form between two points, as flowers or fruits: in *architecture*, an ornament in the form of a wreath of flowers, leaves, or fruit, frequent in Roman and renaissance buildings. Like many of the other ornaments of classic architecture, it owes its origin to one of the sacrificial



Festoon:
St. Mark's Library, Venice.

emblems, viz., the flowers with which the heads of the animals, the altars, etc., used to be decorated. The festoon occurs with bulls' heads on the frieze of the temple of Vesta at Tivoli. The fig. is an example of a renaissance festoon, from the library of St. Mark at Venice. **FESTOON**, v. to adorn with festoons. **FESTOON'ING**, imp. **FESTOONED'**, pp. *-tōnd'*: **ADJ.** made into festoons or adorned with them.

FESTUCEÆ, n. *fēs-tū-sē-ē* [L. *festuca*]: in *bot.*, tribe of grasses containing two families, *Bromide* and *Bambusidæ*, the type of which is *Festuca* or *Fescue-grass*: see **FESCUE**.

FESTUS, *fēs-tūs*, **SEXTUS POMPEIUS**: Latin lexicographer, of the 3d or 4th c.; is one of the most important ancient authorities on the Latin language. He made an epitome of the great work of Verrius Flaccus, *De Verborum Significatione*. This compilation, arranged alphabetically in 20 books, was further abridged and spoiled in the end of the 8th c. by Paul, son of Warnefried, commonly called Paulus Diaconus. The great work of Flaccus has unfortunately entirely perished, and of the abridgment made by Festus, only a single ms., and that deplorably imperfect, has survived. It was brought from Illyria, and fell into the hands of Pomponius Lætus, a distinguished scholar of the 15th c. It ultimately passed into the library of Cardinal Farnese, at Parma, and is now preserved at Naples. The work, in spite of all its imperfections, is a grand storehouse of knowledge on points of mythology, grammar, and antiquities. All previous editions of F. are of little value compared with that of K. O. Müller (Gött. 1839), in which he has made use of the Farnese ms. and other sources, distinguishing the value of each.

FET—FETICH.

FET, v. *fēt* [AS. *fetian*, to fetch, to bring to: Sw. *fatta*, to seize]: in *OE.*, to fetch. **FET**, pp. fetched.

FETAL, a. *fē'tāl*, **FETATION**: see under **FÆTUS**.

FETCH, v. *fēch* [AS. *fetigean*; Fris. *fetje*; Sw. *fatta*; Ger. *fassen*, to seize: Bav. *fessen*, to bring home]: to go and bring; to heave, as a sigh; to bring, as its price; to reach; in *OE.*, to effect or perform. **FETCH'ING**, imp. reaching. **FETCHED**, pp. *fēcht*. To **FETCH UP**, to carry up; to take forward; to make up lost time. To **FETCH OUT**, to develop; to cause to come or appear. To **FETCH A COMPASS**, to make a circuit in order to reach.—**SYN.** of 'fetch': to bring; bear; carry; convey; transport; get; perform; attain.

FETCH, n. *fēch* [Ger. *fatzen*, tricks: Bav. *fatzen*, to play tricks, to jest]: in *OE.*, a trick; the pretense to do one thing while another is intended; a stratagem.

FETCH, n. *fēch*, or **FETCH-CANDLE** [in Scand. myth. *Vætt*, a kind of goblin; *Vætt-lys*, the *Vætt's* candle]: the apparition of one who is alive; a nocturnal light as of a moving candle; the ignis-fatuus or Will-o'-the-wisp. **FETCH, LIGHTS**, the appearance at night as of a lighted candle—supposed to prognosticate death.

FÊTE, n. *fât* [F. *fête*—from OF. *feste*—from L. *festum*, a festival]: a festival or holiday; a gala-day; a showy reception of company. **FETED**, a. *fū'tēd*, honored with a festive entertainment. **FETE-CHAMPETRE**, n. *fât-shōng-pātr* [F.]: entertainment in the open air; a rural festival. **FETE DIEU**: see **CORPUS CHRISTI**.

FETICH, or **FETISH**, n. *fē'tish* [F. *fétiche*—from Port. *feitico*, magic: comp. Gael. *faidh*, a prophet]: among *African negroes*, the selection of any object, as a stone, a tree, a feather, etc., as the supposed residence of a spirit, for temporary worship. **FETICHISM**, n. *fē'tish-izm*, also **FETICISM**, n. *-tī-sizm*, worship of *fetiches*. The word *fetich*, from the Portuguese, somewhat modified, passed into the French language, through Brosse's treatise. *Du Culte des Dieux Fétiches* (Dijon 1760), and from him into German, through the medium of Pistorius (Stralsund 1785). The term has now received European recognition. A *fetich* is anything in nature or art to which a magical power is ascribed, e.g., stones, carved figures, or certain parts of plants, animals, etc. In this general sense *fetichism* coincides with the belief in charms—a belief found also among monotheistic nations. The first step out of *fetichism*, is when ignorant tribes cease to be satisfied with believing merely in the magical power inherent in their *fetiches*, and begin to ascribe a certain conscious operation to the objects of their reverence, especially to the *fetiches* in the forms of beasts or men. In this way the *fetich* becomes an idol, and *fetichism* an idolatry. The lowest form of such idolatry is where the savage does not hesitate to throw away, to chastise, or even to destroy his *fetich*, if it does not appear to gratify his desires. The reverence for sacred woods, mountains, streams, etc., which formed part of the religion of the old Greeks, Celts, and Germans, is

FETID—FETWA.

not fetichism proper, but belongs rather to the worship of nature.

FETID, a. *fēt'id* or *fēt'id* [F. *fétide*—from L. *fetidus*, stinking; It. *fetido*]: having a strong offensive smell; stinking. **FETIDNESS**, n. the quality of smelling offensively. **FETOR**, n. *-tēr*, a strong offensive smell. **FETID LIMESTONE**, variety of limestone which gives out, on being violently rubbed, or struck with a hammer, a smell like that of sulphuretted hydrogen gas. It has a dark color, produced probably from the perishable portions of the animals whose hard skeletons compose the rock. This animal matter may perhaps be the cause also of the disagreeable smell. Stinkstone or Swinestone are characteristic names for this limestone.

FETLOCK, n. *fēt'lok*, or **FETTERLOCK** [Swiss, *fiesloch*;



Fetlocks.

Dut. *vitlok*, the pastern of a horse: Swiss, *fisel*, unravelled threads hanging from a garment: comp. Icel. *fet*, a pace; *lokkr*, a lock of hair: Icel. *fit*, a webbed foot]: in *horses*, the tuft of hair growing a little above the back part of the hoof; the joint on which such hair grows; in *her.*, a horse fetlock seems to denote an instrument fixed on the leg of a horse when put to pasture, for preventing him from running off. In *Scotch heraldry*, a hoop is usually substituted for the chain. **FETLOCKED**, a. *-lōkt*, having fetlocks; tied by the fetlocks.

FETTER, n. *fēt'tēr*—usually in the plu. **FETTERS**, *-tērz* [AS. *fæter*; Dut. *veter*; Icel. *fjötr*, shackles, bonds—from *fet*, a footstep; *fjötra*, to hinder, to hobble a horse]: chains for the feet; anything which confines or restrains: V. to put fetters on; to restrain; to shackle; to hamper; to limit; to confine. **FETTERING**, imp. **FETTERED**, pp. *-tērd*. **FETTERLESS**, a. without fetters.

FETTLE, v. *fēt'tl* [Icel. *filla*; Bav. *fiseln*, to make light movements with the fingers: prov. Sw. *futtla*, to fumble with the fingers]: to set in order; to repair; to set about keenly: N. good condition; proper repair: ADJ. well adapted; well knit. **FETTLING**, imp. *fēt'ling*. **FETTLED**, pp. *fēt'ld*.

FETTSTEIN, n. *fēt'stīn* [Ger. fat stone]: same as **ELÆOLITE** (q.v.).

FETUS, **FETAL**: see **FÆTUS**.

FETWA, or **FETWAH**, *fēt'wā* [Arab.]: in *Turkish law*, written decision of a Turkish mufti upon a legal point.

FEU.

FEU, n. *fū* [Prov. *feu*, feudal tenure—from Icel. *fé*; AS. *feoh*, cattle, money, price—contr. from FEUDAL, which see]: in *Scot.*, a conditional allotment of land; a right to the use and enjoyment of lands, houses, or other heritable subjects, in perpetuity, in consideration of an annual payment in grain or money, called *feu-duty*, and certain other contingent burdens called casualties of superiority (see CASUALTY). FEU, v. to grant a perpetual right to a portion of land on which tenements may be erected, subject to an annual payment called the *feu-duty*. FEU'ING, imp. FEUED, pp. *fū'd*. FEU'AR, n. *-ér*, one who holds land or houses on a *feu-rent*.—*Feu*, though referring originally to a tenure of land on condition of military service, was frequently used to express any kind of tenure by which the relation of superior and vassal was constituted; but its narrower meaning, above indicated, is that in which it is now almost exclusively used. A feu, in short, was and is a perpetual lease; and though in Scotland feus resemble English freeholds in substance, their forms agree mostly with copyhold tenure. See Paterson's *Compendium of English and Scotch Law*. The system of feuing property for building purposes, if it were freed from some entangling and burdensome incidents, seems to have several advantages over that of the long building-leases common in England and the United States. From its perpetual character, it gives to the person actually in possession a feeling of greater interest in the property, and usually leads him to erect more enduring structures. For as time runs on, the feu often increases in value, while the reverse must always be the case with leasehold property. Neither does the feu in any degree interfere with the letting of property on lease or otherwise. Almost all the houses in Edinburgh and the other towns in Scotland which are let, either on leases or from year to year, are held by those who are spoken of as their proprietors, not in absolute property, but as feus. The deed transferring the land in feu from the superior to the vassal is called a *feu-charter*—a clumsily conceived and expensive document, which, with some of its inconvenient conditions, might to advantage be set aside for some better form. For the most part, Scotch land proprietors near towns and manufacturing villages are desirous to add to their annual rental by feuing grounds for building purposes. The rate of feu is very various, but whatever be the amount, it is payable by the feuar—not the tenant to whom the feuar may have let the property. When a building consists of several floors forming distinct dwellings, the feu-duty is allocated in certain proportions among the respective proprietors; the feuar to whom the lower floor belongs usually paying most. In properties of this kind, each is responsible only for his own share. Occasionally, feu-duties are offered for sale; and as a safe investment, bring from 25 to 30 years' purchase. In such cases, the 'vassal' (old feudal term) has an opportunity of extinguishing his feudal tenure, and becoming the superior. There are also instances of vassals sub-feuing. It is customary in feuing building lands for the superior to make

FEUD.

the roads and drains. See FIARS: FEE AND LIFERENT (under FEE).

FEUD, n. *fūd* [Goth. *fiathva*, enmity—from Goth. and A.S. *fian*, to hate: A.S. *feght*, seemingly another form of *fight*, allied to *foe*, and prob. to *fiend*: Ger. *fehde*, feud, quarrel: comp. Gael. *fuath*, hate]: a contention or quarrel; an inveterate quarrel between families, clans, or factions—a war waged by one of such parties, to avenge the death or other injury of one of its members. In a certain state of society, this is a legitimate, because the only mode of obtaining redress. It prevailed extensively among the nations of n. Europe; and only by gradual steps the practice was first restricted and then abolished. The laws of Rudolph I. of Germany recognized the right of waging feuds. At last, partial associations were formed, the members of which bound themselves mutually to settle their differences by courts of arbitration and compensation, without going to war.—SYN.: affray; fray; broil; contest; dispute; strife; contention; quarrel.

FEUDAL, a. *fū'dāl* [mid. L. *feudālis*, a vassal; *feudum*, applied to the property in land distributed to his companions in arms by William the Conqueror—from Prov. *feu*: It. *feudo*, conditional allotment of land: comp. Icel. *fé*, a fee or fief; *odal*, property by allodial tenure (see FEE and FEU)]: pertaining to *feus*, or *fiefs*; pertaining to the system by which lands were held on the condition of military service. FEUDALISM, n. *-izm*, the principles and constitution by which lands were held by military services (see FEUDAL SYSTEM). FEUD, or FEOD, n. *fūd*, a conditional allotment of land; a fief; a fee. FEUDALIST, or FEU'DIST, n. [F. *feudiste*]: one versed in feudal law. FEUDALITY, n. *fū-dāl'-i-tī*, state of being feudal; feudal form or constitution. FEUDALIZE, v. *fū'dāl-iz*, to reduce to a feudal tenure. FEUDALIZATION, n. *-ā'shūn*, act of reducing or conforming to feudalism or feudal tenure. FEU'DARY, a. *-dēr-ī*, holding land of a superior: N. one who holds lands by feudal service. FEU'DATORY, n. *-dā-tēr-ī*, a tenant or vassal who holds his lands of a superior on the condition of military service: ADJ. holding from another on certain conditions. *Note*.—All such terms as *fee*, *fief*, *feu*, *feudal*, etc., had their origin in primitive and pastoral ages, when cattle implied wealth and money, and payments were made in kind or cattle. These and similar terms are accordingly derived from the general names for cattle—thus L. *pecūniā*, money—from *pecūs*, cattle: Gael. *feudail*, cattle, herds: Goth. *faihu*, possessions.

FEUDAL SYSTEM.

FEUDAL SYSTEM: principles or social constitution, by which lands were held on condition of military service. By some, the word feu or feud, of which feudal is the adjective, is derived from the Lat. *fides*, faith, and *ead* or *odh*, or *od*, a Teutonic word signifying a property, or estate, in land; while others, with greater probability, maintain that the first syllable also is Teutonic, equivalent to *vieh*, cattle, ultimately from the same root with the Latin *pecus*, which in the form of pecunia, came to signify property, and its representative, money—because, as Varro remarks, property among pastoral nations consisted of cattle (Varr., *De Lingua Latina*, 5, 19, s. 95, ed. Mull). See **FEUDAL**.—*Note*. A feudum, in this sense, would be a piece of land held for a *fee*, or pecuniary consideration, using pecuniary in a wide sense which its etymology suggests. Be this as it may, the feudal system, as a developed institution, belonged neither to the Teutonic nor to the Romanic nations, in their original and unmixed condition. We find it neither in the woods of Germany, nor in the Roman empire previous to the incursions of the Franks and Lombards. Neither the institutions described by Tacitus, nor those with which the Roman jurists have rendered us familiar, exhibit anything analogous to it as a whole. But they each exhibit partial indications of some of the characteristics which peculiarly distinguish it; and as it arose about the beginning of the 9th c., just when the fusion between the conquering barbarians and the subject populations of the Romanized provinces was everywhere taking place, it seems impossible to doubt that it was a result of the mutual influence of the two races. The subordination of class to class, and the intimate relations by which all the classes of the community were bound together, together with the independence and equality of the individual members of each class within itself, were among the prominent features of the simple society of the Teutonic nations; and these correspond with wonderful accuracy to the relations of superior and vassal, beginning with the sovereign and descending to the smallest feudal proprietor, and also with the equality among *peers*, which existed within each of the feudal classes. On the other hand, the incomplete and fiduciary character of the proprietorship implied in a *feu*, as held in trust from a superior on the faith of services to be rendered, or dues to be paid, bore a very close analogy to the Roman *emphyteusis* (from which indeed the word feu has often been derived), and to the *dominium utile* as opposed to the *dominium directum*: see **DOMINIUM: EMPHYTEUSIS**.

The nature of this very important social institution, by which the life of every European people of any importance was governed from the beginning of the 9th till the close of the 13th c., and by which many of the forms of our modern life are still affected, will probably be more clearly understood if its examination be begun from below, by exhibiting the position of the simple land-holder, than by beginning with the monarch in whom it culminated, and from whom, in a technical sense, it was supposed to

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flow (see ALLODIUM). The latter course has been more strictly adhered to by English writers, from the fact that, subsequent to the Conquest, the whole territory of England was regarded as the property of the conqueror, and was by him divided among his barons, and by them among their dependents, an arrangement somewhat peculiar to England (see ALLODIAL), whereas the feudal system in its essentials was common to the whole of Europe. A feudal proprietor, then, or feudatory, was a person who held his lands from another for his own lifetime merely, in the earlier times, on condition of certain services which he was to perform to a superior or suzerain. Apart from the duties to which he was thus bound, he was not only a free man, but his position was that almost of an independent sovereign within his own small dominions. If his holding was extensive, he lived in a castle, which, notwithstanding the efforts of Charlemagne and his successors to prevent it, was generally fortified, not only for defense, but to enable him to pursue that life of rapine which in lawless times was not considered inconsistent with honesty or personal worth. For greater security, the castle was generally situated on a height, and under its walls there nestled a village, in which all the dependents of the proprietor with the exception of his immediate family, and all those who lived by the cultivation of the soil, usually dwelt—isolated farmhouses and cottages being too much exposed to plunder to admit of their being scattered over the country then. A portion of the inhabitants of each feudal domain were usually bound to the soil, and were thus subject to a species of slavery or serfdom, the conditions of which varied according to the customs of different districts. These were spoken of as *adscripti* or *adscriptitii glebæ*, and were called *nativi*, or bondmen, and *villein-socmen*, as opposed to free-socmen on the one hand, and serfs or *theowes* on the other, whose position is noted below. (Stephen's *Com.* i. p. 188). 'He was,' says Sir Francis Palgrave, speaking of the ceorl, 'a villain appurtenant; and, notwithstanding the language which was employed (to the effect, namely, that he could be bequeathed, bought, and sold), it must be understood that the gift, the bequest, or the sale, was in effect the disposition of the land and of the ceorl, and of the services which the ceorl performed for the land, a transaction widely differing from the transfer of a slave, whose person is the subject of the purchase.' (*Rise and Progress of the English Commonwealth*, I. 18). The ceorl, moreover, could purchase his own freedom and that of his wife and offspring (*Ib.*). See VILLEIN. The rest were free tenants, farmers in the modern English (not American) sense, though personal services to the proprietor probably in almost every case constituted a portion of the rent which was paid: see FARMER. Latterly, when the system of subinfeudation was introduced, many of the baron's wealthier tenants came to stand to him as the lord of the domain, very much in the relation described below as subsisting between him and his lord paramount. From being tenants-at-will, scarce-

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ly less subject to his authority and exposed to his caprices than the thralls, or villeins of the lowest class, they became vassals of their lord, and free citizens of what thus gradually developed itself into a feudal monarchy in miniature. The tenure by which this latter class held their lands was generally known in England as Free Socage (Stephen's *ut sup.* i. 205 *et seq.*). The castles by which the banks of the Rhine are studded from Bonn to Bingen, with their villages and parish churches, for the most part in the condition in which they were erected centuries ago, afford numerous and perfect examples of the arrangements of the feudal period. The possessors of these castles stood in a magisterial as well as a proprietary relation to their dependents. They exercised jurisdiction, extending even to the infliction of capital punishment, either in person or by means of officers whom they appointed for the purpose; and the castle was in general furnished with dungeons and other appliances for carrying their sentences into execution. Toward each other they stood in the relation of equals, or peers (Lat. *pares*); they were neighbors, simply, and friends or enemies at the case might be—too often the latter. But toward their immediate feudal superior, the count, marquis, duke, or whatever might be his title, to whom the government of the whole district belonged, they all stood in a relation which brought them in contact, and in some degree bound them to each other. Of him they held their lands on conditions somewhat similar to those on which they let them out to their own dependents. At first they were only tenants for life; but their rights in most countries very early assumed a hereditary character, the dominant proprietor's rights, on the death of *atenant*, being confined to the exaction of certain dues from his son and successor, as a consideration for conferring on him, or rather for confirming to him, the *feu* which his father had held. Where the *feu*, *fief* or *feoff*, as it was sometimes called from the mode of admission—*feoffment*—in Scotland, *infestment* (q. v.)—descended to a female, the dominant proprietor was entitled to control her marriage, for the purpose of procuring himself a sufficient and trustworthy vassal; a privilege which, like all those of the lord, was latently converted into a mere pecuniary claim. When the lord paramount, or suzerain, as he was called, held his court of justice, his vassal barons were the judges, being all on a footing of equality, or *pares curiæ*, as it was called. When he made war, either on his own account, or as furnishing a contingent to the army of the state, in such cases as in the national wars between France and England in the 12th and 13th c.—the earliest modern European instances of really national wars—his vassals were bound to attend him in person, and to furnish each the contribution of men, horses, arms, and other materials of war for which he was liable by the tenure on which he held his lands. In addition to these services, he was bound to watch and ward his castle, a duty which the minor barons almost invariably imposed on their vassals when the system of granting *feus* extended downward to the class of persons who had

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formerly been mere tenants-at-will. Then there were certain dues almost always exigible from the vassal, such as contributions toward providing a ransom for his lord when in captivity, for enabling him to celebrate the marriage of his eldest son with due pomp, or to provide a suitable dowry for his daughter. If these dues were not paid, the land reverted to the dominant proprietor, in relation to whom the vassal all along was a mere usufructuary. So far were the conditions of feudal holdings from being always the same, that no less than 80 different tenures have been enumerated; the onerous character of which varied from what was merely nominal, e. g., the payment of a white rose or a pair of spurs, 'if asked merely,' up to what was a rent in some degree corresponding to the value of the land. For an account of the manner in which the feudal system affected the constitution of land rights and the conveyance of landed property, and still affects them, see CONVEYANCING.

Inferior to all the classes of society in feudal Europe of which we have hitherto spoken, there is reason to believe that there existed almost everywhere, in the earlier times, a class of the positively unfree. The lot of those who were in absolute slavery excluded them from the influences of feudality as a legal and social institution—'they were not reckoned,' says Palgrave, 'among the people'—but their existence is by no means to be left out of account, in forming to ourselves a picture of European society in feudal times. Of the condition of this class, as forming the substratum of feudal society, a conception may be drawn from the following passage, in which Lappenberg describes them in Anglo-Saxon times, if we bear in mind, on the one hand, that subsequently to the Conquest their ranks were probably swelled by those of the Anglo-Saxon population who were in absolute poverty; and on the other, that their position, in all the countries of Europe was gradually ameliorated by the influences of Christianity, the spirit if not the letter of which has everywhere proved hostile to slavery. 'One class of the Anglo Saxon population, at the period of the Norman Conquest, consisted of the unfree or servile (*theowas*, *esnas*), whose number, as registered in Domesday book, was little more than 25,000. Of these, the majority were in a state of slavery by birth, whose forefathers had been either Roman slaves, British prisoners of war, or other enemies. Others, denominated, *wite-theowas*. or penal slaves, had been freemen, but reduced by the sentence of the law to the servile condition, on account of debt or delinquency. (Palgrave *ut sup.* i. 28.) The master had the right of selling the theow in the country, but not beyond the sea, even if he had perpetrated crime. In other respects, the condition of the servile seems to have differed little from that of the indigent free slaves who had a special wergild, half of which fell to the master and half to the kin.' (Thorpe's Lappenberg, ii. p. 320.) It is probable that the vast majority of the servile class in Anglo-Saxon, and even in Norman times, consisted of persons of Celtic blood. (Palgrave *ut sup.* p. 26.) In proof of this fact, Lappenberg remarks that their

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numeroers diminish as we recede from the Welsh border and from Cornwall, the places in which the Celtic or original British population is known to have taken refuge.

The social elements which counteracted and mitigated the influences of feudality in mediæval life, were monarchy, the church, which vigorously promoted the emancipation of the unfree, and above all, the growing wealth, power, and importance of the commons. In order to free himself from the rude and insolent dictation of his great feudal vassals, the barons, the king in almost every European state, courted the alliance of the town communities, who had remained more in the condition in which they had been left by the Romans than the inhabitants of the country, and who were consequently all along more or less opposed to the growth and influences of feudality: see **MUNICIPIUM**. By their aid, even before the formation of standing armies, something approaching to executive power was placed in the hands of the sovereign. He was thus enabled to appoint and enforce the decrees of independent judges of his own, who in the earlier time were generally churchmen, and thus greatly to circumscribe the power and influence of all classes of feudal proprietors over their dependents. Though the period of bloom of the feudal system was from the 9th to the 13th c., in most of the countries of Europe it everywhere, in many of its features, long survived the latter period. Even considered as a social, and not merely as a legal institution, in which latter capacity it still exists, it was in many respects in vigor in Scotland till 1747, when military tenures were abolished by statute, as dangerous to public tranquillity.

FEU-DE-JOIE, n. *fö'dö-zhwa* [F. fire of joy]: a 'running fire' of guns on any joyful occasion, the soldiers being drawn up in lines in open order—the men, beginning at the right, fire upward, one at a time, in regular succession at scarcely perceptible intervals along the whole lines, repeated three times, and followed by three cheers.

FEUERBACH, **LUDWIG ANDREAS**: German philosopher: 1804, July 28—1872, Sep. 13; b. Anspach; fourth son of Paul Johann Anselm, Ritter von F. After studying theology two years at Heidelberg under Paulus and Daub, in 1824 he was attracted to Berlin to hear Hegel, and soon abandoned theology for philosophy. In 1828 he became *privatdocent* in the Univ. of Erlangen, but in a few years quitted the academical chair, and gave his whole time to literary labor. In a small anonymous work (*Gedanken über Tod und Unsterblichkeit*, Nürnberg 1830), which attracted little attention when it appeared, he indicated that he had already gone beyond his master Hegel, by combating the doctrine of immortality. During the next few years, he published three works on portions of the history of philosophy, treating severally of the period between Bacon and Spinoza, of Leibnitz and of Pierre Bayle. But these historical works only paved the way to a critical investigation into the nature of religion and its relation to philosophy, the results of which have been given to the world in several works well known to speculative theologians. The most celebrated is

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his work on the Nature of Christianity (*Das Wesen des Christenthums*, Leip. 1841; 2 Aufl. 1843), translated into English. Starting from the Hegelian doctrine, that the Absolute comes to consciousness only in humanity, F. denies to the Absolute any existence beyond the human consciousness, maintaining it to be merely the projection by man of his own ideal into the objective world on which he feels his dependence. All authority above man, and consequently all moral obligation, is therefore consistently regarded as a delusion proceeding from man himself—which, if a fact, involves the conclusion that man's constant nature is itself a delusion—and the highest good is explained as that which is on the whole most pleasurable. Yet even this highest good is further explained as consisting in resemblance to that ideal humanity which man creates for himself and worships as God. A kind of ideal and unreal theism is thus retained by F.; but when his doctrines were adopted by the mass of German communists, they degenerated, perhaps logically, into an actual atheism, which ignored any moral or social law imposed on the individual from any other source than himself.—The works of F. have been collected, with additions and corrections to bring them into accordance with his later views (*F.'s Sämmtliche Werke*, 10 Bde., Leip. 1846-66). See Karl Grün's *Ludwig F.* (1874), and Beyer's *Leben und Geist F.'s* (1873).

FEUERBACH, *foy'er-bäch*, PAUL JOHANN ANSELM, Ritter von: one of the most distinguished criminal jurists of Germany: 1775, Nov. 14—1833, May 25: b. Jena. Brought up at Frankfurt-on-the-Main, where his father was an advocate, and educated in the gymnasium there, he went 1792 to Jena, and then applied himself to positive law. In 1798 he appeared as criminal jurist in a work *On the Crime of High Treason*, and in the following year he began to deliver lectures in the Univ. of Jena. In his lectures and published writings, he introduced into criminal jurisprudence a new method of treatment, which was systematized in his Compendium of German Penal Law (*Lehrbuch des Gemeinen, in Deutschland geltenden peinlichen Privatrechts*, Giessen 1801; 14 Aufl. von Mittermaier 1847). This celebrated work placed F. at the head of a new school of jurists, who maintain that the decision of the judge in every case ought to be determined solely by an express deliverance of the penal law, never by his own discretion, and who on that account obtained the name of Rigorists. In 1801 F. was appointed ordinary prof. in Jena, but 1802 accepted a call to Kiel. In 1804 he was removed to the Univ. of Landshut; but next year, having received a commission to prepare a penal code for Bavaria, he was transferred to Munich as privy referendary for the ministerial, judicial, and police departments; and 1808 was appointed privy-councilor. The new penal code which he planned for Bavaria (*Strafgesetzbuch für das Königreich Baiern*, München 1813), received, after a few modifications, the royal approval, and was taken as a basis in the emendation of the criminal law of several other countries. During this period he published *Remarkable Cases in Criminal*

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Law (*Merkwürdige Criminalrechtsfälle*, 2 Bde, Giessen 1808-11), which led the way to a deeper psychological treatment of such cases. In 1812, he published a work on Trial by Jury, to which a second vol., on the Judicial Procedure of France, was added 1825, as the result of a visit to Paris 1821. In 1817 he became second pres. of the court of appeal in Bamberg, and afterward first pres. of the court of appeal at Anspach for the Rezat district. In 1832 he published a work on the unfortunate Kaspar Hauser, whose mysterious fate had strongly attracted his interest. He had just edited a collection of his miscellaneous writings, when he died at Frankfurt-on-the-Maine. An interesting life of F. has been written by his son, Ludwig (*Leben und Wirken Anselm von Feuerbachs*, 2 Bde. Leip. 1852). F. left three daughters and five sons, who have distinguished themselves in German literature.

FEUILLANS, *fě-yángz*, CONGREGATION OF: a reform of the Cistercian order, remarkable as forming part of the great religious movement in the Rom. Cath. Church during the 16th c., contemporary with and probably stimulated by the Reformation. The author of this reform was Jean de la Barriere, abbot of the Cistercian monastery of Feuillans, who, painfully struck by the relaxation of its discipline, laid down for himself a new and much more austere course of life, in which he soon found many imitators and associates among the brethren of his order. The rule thus reformed was, after considerable opposition from the advocates of the old rule, approved, with certain modifications, by Pope Sixtus V.; the reformed congregation, however, being, still left subject to the authority of the abbot of Cîteaux; and a convent was founded for them by Henry III. in the Rue St. Honoré, Paris. The subjection to the abbot of Cîteaux was removed by Clement VIII. 1595; and Urban VII. 1630, separated the congregation into two branches, one for France, the other for Italy, each under a distinct general. The rules of both these branches were subsequently modified about the middle of the same century.

FEUILLANTS, *fě-yángz*: celebrated revolutionary club named from the order of the Feuillans (q.v.), whose convent in the Rue St. Honoré was the place of meeting for the club. It was founded 1790 by Lafayette, Sièyes, Laroche-foucauld, and others holding moderate opinions. The club, at first called the 'Company of 1789,' was intended to support the constitution against the ultra party. It reckoned among its members individuals of all classes, who took the constitution of England as their model. This opposition served, however, only to accelerate the revolutionary movement. 1791, Jan. 27, on Count Clermont Tonnerre being elected pres. of the club, a popular insurrection broke out against it; and the assembly in the cloister was forcibly dispersed by a raging mob.

FEUILLEA: *fū-ŭ'ē-a*: genus of plants of the nat. ord. *Cucurbitaceæ*, named in honor of Louis Feuillée, French botanist and traveller in Chili. The species are generally half-shrubby climbers, natives of the warm parts of

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America. The seeds, at least of some, as *F. cordifolia* and *F. trilobata*, contain a great quantity of a bitter fixed oil, obtained by expression, and used for lamps. It has high reputation in the W. Indies and Brazil, as a cure for serpent-bites, and an antidote to some vegetable poisons.

FEUILLET, *fêh-yâ'*, OCTAVE: 1812, Aug. 11—1890, Dec. 30; b. Saint-Lô, France: author. Educated at the College of Louis-le-Grand, he became literary assistant to the elder Dumas; began his own literary career under the pen name Désiré Hazard 1844; was elected to the French Acad. 1862; appointed an officer of the Legion of Honor 1863; and was for several years librarian of the imperial residences. He has been a frequent contributor to the newspapers and reviews; written many comedies, dramas, and farces; and has exhibited excellent gifts as a writer of fiction. His publications include *Polichinelle* (1846); *Onesta* (1848); *La Rédemption* (1849); *Bella* (1850); *Le Cheveu Blanc* (1853); *La Petite Comtesse* (1856); *Le Roman d'un Jeune Homme pauvre* (1858); *Sibylle* (1862); *Monsieur de Camors* (1867); *Julia de Tréceur* (1872); *Un Mariage dans le Monde* (1875); *Les Amours de Philippe* (1877); *Le Journal d'une Femme* (1878); *L'Histoire d'une Parisienne* (1881); *La Veuve*; and *La Morte* (1886).

FEUILLETON, *fô'i-tóng* [F. a small leaf—from *feuille*, a leaf]: in France, that portion of a political newspaper set apart for criticisms on art, literature, etc., usually separated from the main sheet by a line. The F. is an invention of the *Journal des Débats*, which, since 1800, has held an important place in the sphere of literary criticism. By degrees, the belles-lettres element began to pervade it; and the result was a species of light journalistic literature, in which Jules Janin became the acknowledged king. In the years immediately preceding the revolution, 1848, Feb., entire romances were spun out in the feuilleton. The *Constitutionnel*, in particular, made large pecuniary profits by the social romances of Eugene Sue, which it published in this manner. The French system has been imitated in England and Germany, though with less success than in France.

FEUTER, or **FEWTER**, v. *fû'têr* [OF. *feutrer*, to cover with, to pad]: in *OE.*, to make ready; to fix in a rest. **FEUTERING**, imp. **FEUTERED**, pp. *-têrd*.

FEUTERER, n. *fû'têr-êr* [OF. *vaultre*, a boar-hound]: in *OE.*, a dog-keeper; the man who lets the dogs loose from the slips.

FEVEDA, *fêv'da*: island of British Columbia, in the Gulf of Georgia, between Vancouver Island and the continent; lat. 49° 41' n., and long. 124° w.; 32 m. in length by 2 in average breadth. It possesses a snug little harbor, which has additional value from the superior quality of the fuel which abounds on the shores. The island is understood to be wholly of limestone.

FEVER.

FEVER, n. *fě'vēr* [F. *fièvre*; OF. *fevre*—from L. *febris*, a fever—from the notion of shivering; Bav. *fibern*, to tremble with anger or desire]: a disease marked by a quickened pulse, an increase of heat, great thirst, etc.; agitation; excitement: V. to put into a fever. **FE'VERING**, imp. **FEVERED**, pp. *fě'vèrd*. **FE'VERISH**, a. having a slight fever; hot. **FE'VERISHLY**, ad. *-lī*. **FE'VERISHNESS**, n. the state of being feverish; mental restlessness. **FEVER-FEW**, n. *fū* [L. *febrifugā*—from *fūgārē*, to put to flight]: an herb like the ox-eye daisy. **FEVER'ROOT**: same as **FEVERWORT** (q.v.). **FEVER-TREE**, n. the blue gum-tree, *Eucalyptus globulus*. **FEVER-WEED**, n. plant of the genus *Eryngium* (see below).

FEVER [Lat. *febris*, from *ferveō*, I grow warm, or perhaps from *februō*, I cleanse]: form of disease characterized principally by increase of the temperature of the body, which, however, requires to be estimated according to the state of the internal parts, rather than the external; the surface of the body, and particularly of the extremities, being frequently cold rather than warm. Having regard to the heat of the surface only, F. has commonly been considered as passing through three distinct stages, more or less marked: 1, the cold or shivering stage; 2, the hot stage; 3, the sweating stage. This description is perfectly correct in most cases, but it requires to be qualified by the remark, that even in the cold stage of fevers, it is now well ascertained that the blood and the internal organs have an elevated temperature, as estimated by the thermometer introduced into the cavities of the body. In the cold stage of F., accordingly, and even in the most violent ague, when the teeth are chattering with cold, and the whole surface is pale and clammy, the state of the system is well expressed by the aphorism of Virchow (the most ingenious and comprehensive of modern exponents of the pathology of F.), to the effect that 'the outer parts freeze while the inner burn.' Increased heat of the body, therefore, is the most essential, perhaps the only essential phenomenon of F. The other symptoms are loss of appetite, thirst, restlessness, and vague general uneasiness, often headache, and diffused pains in the back and limbs; a frequent pulse, which is sometimes full and hard; a furred tongue, often with red margin; a flushed face and suffused eyes; vitiated secretions, and general derangement of the functions, with great debility of the voluntary movements of the limbs. The disease often commences with a shivering, or rigor as it is technically called; this leads through the cold stage to the hot, which usually follows rapidly, and is attended by all the febrile phenomena in their highest degree; the skin being often very pungently warm to the hand, dry, and harsh; by and by, the pores appear to open, moisture begins to bedew the surface, and the pungent heat disappears: the disease is then about to pass into its third or sweating stage, which ushers in the convalescence. For the special symptoms of particular fevers, see **TYPHUS** and **TYPHOID FEVERS**: **SMALL-POX**: **SCARLET FEVER**: **MEASLES**: **AGUE**: **INTERMITTENT FEVER**: **REMITTENT FEVER**: **YELLOW FEVER**.

FEVER.

Besides being thus the leading fact in a number of specific diseases, F. is also associated with many other forms of disease as a secondary or subordinate phenomenon, connected with an inflammation or other distinctly local disease. Thus, in pneumonia (q.v.) or enteritis (q.v.) F. is as much a part of the symptoms as pain or any other; and even in some chronic or long-standing diseases, as in consumption (q.v.), a slow and consuming type of F. (see **HECTIC FEVER**) is very generally present. Indeed, there is no condition which rules so large a part of the physician's duty, whether in the way of distinguishing diseases or of curing them, as this constitutional state. F. is also very generally prevalent after surgical operations and injuries, of which it constitutes one of the leading dangers; and in midwifery practice, it is well known as constituting a large part of the risks of the puerperal state, whether in the slighter form commonly called *a weed*, or in the more dreaded and fatal, often epidemic, form of puerperal fever (q.v.).

The family of fevers is thus separated naturally into two large groups, in one of which the F. is the greatly predominating fact, and determines the specific character of the disease—the local disease (if present) being quite subordinate, and usually secondary in point of time; the other, where the opposite order prevails, and the F. is obviously secondary. Hence the distinction in medical language between *idiopathic* (i.e., self-originating, spontaneous) and *symptomatic* or secondary fevers. Fevers are distinguished also with reference to their mode of diffusion, as Epidemic (q.v.) and Endemic (q.v.); or with reference to their supposed cause, as contagious, infectious, malarious, pneumonic, rheumatic, etc.; or with reference to their incidental symptoms and their peculiarities of course and termination (the presumed *specific* phenomena attracting, of course, particular attention), as eruptive (see **EXANTHEMA**) or non-eruptive, bilious, gastric, enteric, mucous, putrid, malignant, typhoid, etc.

Among these distinctions, based upon the course of the F., one demands particular notice, as involving an important law of febrile diseases generally, and of a large class of fevers of warm climates in particular. Periodic increase and diminution, or paroxysms of longer or shorter duration, with intervals of more or less perfect relief from all the symptoms, are characteristic of most diseases of this kind, but especially of those arising from *malaria*, i.e., emanations from the soil, educed under the influence of solar heat. The duration of the paroxysms and of the intervals, the complete *intermission*, or more partial *remission*, of symptoms, become in such cases the characteristic facts that mark the *type*, as it is called, of the F., which is accordingly distinguished as intermittent, remittent, or continued; and, according to the length of the periods, tertian, quartan, quotidian, etc. (q.v.).

The true pathology, or ultimate essence of the febrile state, is still open to question; but it is in accordance with modern physiology to regard F. as connected with some

FEVERFEW—FEVERWORT.

complex derangement of the functions on which the animal heat is known to depend—viz., the nutrition of the textures, or the vital changes constantly in operation between the blood, on the one hand, and the ultimate atoms of solid texture, on the other. Recent observations have shown that, in the paroxysm of ague, the waste of the nitrogenous tissues is in excess; and further, the curious result appears to be arrived at, that for almost every grain of excretion representing this excess of waste in a given time, there is a proportional increase of the temperature of the blood, according to accurate thermometric observations. If such observations are corroborated and extended, it will probably appear that the cause of F. is to be found in an increased destructive decomposition of the atoms of texture through the oxygen absorbed at the lungs and circulated with the blood; perhaps under the influence of a derangement of the nervous system. Some investigators have been led by the GERM-THEORY (q.v.) to regard some of the specific fevers as parasitic diseases.

For the treatment of fever, see the several titles above referred to.

FEVERFEW (*Leucanthemum parthenium*): perennial plant of the *Tubulifloræ* of the nat. ord. *Compositæ*, growing in waste places and near hedges. It is botanically allied to Chamomile (q.v.), and still more nearly to Wild Chamomile (*Matricaria chamomilla*), and much resembles these plants in its properties, but differs in appearance, the segments of its leaves being flat and comparatively broad, and its flowers smaller. Its habit of growth is erect, its stem much branched, and about 1—2 ft. high. It has a strong, somewhat aromatic smell. It was formerly a popular remedy in ague, and from time immemorial has been used as an emmenagogue. It is employed in infusion, and is stimulant and tonic. A double variety is not uncommon in gardens. It has escaped from gardens in the United States, in some places. Of the same genus is our showy but



Common Feverfew (*Matricaria parthenium*):

a, floret of the ray; b, floret of the disc; c, fruit, showing the toothed membranous papus.

troublesome Ox-eye Daisy (*L. vulgare*), naturalized from Europe. The name *Leucanthemum* means white flower.

FEVERWORT (*Triosteum perfoliatum*): perennial plant of the nat. ord. *Caprifoliaceæ*, having an erect, hairy, fistular stem, 1-4 ft. high, opposite ovato-lanceolate

FEW--FEZ.

entire leaves, axillary whorls of flowers, with tubular 5-lobed corolla, and leathery 3-seeded berries. It is a native of N. America, where its dried and roasted berries have been occasionally used as a substitute for coffee, but it is valued chiefly for its medicinal properties, its root acting as an emetic and mild cathartic. It is sometimes called *Tinkar's Root*, from Dr. Tinkar, who first brought it into notice.

FEW, n. *fū* [Goth. *fars*; AS. *fewa*; Icel. *fár*; L. *paucus*, little, few]: not many; small in number. FEWER, comp. FEWEST, sup. FEWNESS, n. smallness of number. IN FEW, in *OE.*, with few words; in brief terms.

FEW, WILLIAM: 1748, June 8—1828, July 16; b. Baltimore Co., Md.: legislator. He received a thorough education, was admitted to the bar, and removed to Augusta, Ga., to practice, 1776. The same year he was chosen a member of the assembly and a delegate to the convention to frame a constitution, and became a member of the council. He served through the revolutionary war as col., became surveyor-gen., and presiding judge of the Richmond co. court 1778, was a representative in the continental congress 1780-83, a member of the federal constitutional convention, 1787, and one of the first two U. S. senators from Ga., 1789-93. During 1794-97 he was judge of the state circuit court. He removed to New York 1799, July., was in the legislature 1802-05, and was afterward commissioner of loans and mayor.

FEY, a. *fū* [AS. *fæge*, doomed to die: Icel. *feigr*, destined to die: Dut. *veeg*, about to die: F. *fée*, a fairy]: in *Scot.* and *OE.*, in the power of the fates; doomed; fated.

FEZ, n. *fēz*: in *Turkey*, red cap without a brim, worn by men; a smoking-cap.

FEZ, *fēz* (Ar. *Fas*): chief and most northerly province of the empire of Morocco; between the Atlas Mountains and the Mediterranean. It is divided into 15 districts. Pop. (Berbers, Moors, Arabs, Negroes, Jews, and a few Europeans) estimated abt. 3,200,000.

FEZ: capital of the province of F.; lat. 34° 6' N., and long. about 5° 0' W.; founded by Muley Edris II., 808, and reckoned during the middle ages—when it was cap. of the kingdom of Morocco—one of the most magnificent and largest cities in the Mohammedan world. It is said to have contained about 90,000 dwelling-houses, and about 700 mosques, and was celebrated for its splendid public buildings, schools, and scientific institutions. On the removal of the court to Morocco, about the middle of the 16th c., F. gradually fell into decay. It is still, however, a place of importance. The situation of F. is singular; it lies in a valley, formed by surrounding hills into a sort of funnel, the higher parts of which are covered with trees, orange groves, and orchards. It is divided into Old and New F. by one of the upper branches of the Sebu. There are 100 mosques, of which the most important is that built by the Sultan Muley Edris, which contains his monument, and is an inviolable refuge for criminals, however, guilty. On

FEZZAN—FIACRE.

account of its numerous mosques and relics, it is regarded as the Holy City of the western Arabs. It has seven well-attended schools. The old palace of the sultan is large, but is now falling into decay. In other respects, the external aspect of F., with its numerous baths, caravanseras (of which there are about 200), and bazaars, resembles that of Mohammedan towns in general; the multitude of hotels and shops alone imparting to it a more European character. Considerable trade is still carried on, by caravans, with the adjoining countries on the s. and e. extending as far as Timbuctoo. F. has manufactures of woollens, sashes, silk-stuffs, girdles, slippers, fine carpets, etc. Its artisans are also skilful workers in gold and jewelry. Pop. estimated from 100,000 to 150,000.

FEZZAN, *fěz-zân'* (correctly FESSAN): extensive oasis in the n. of Africa; s. of the regency of Tripoli. 24° – 31° n. lat., and 12° – 18° e. long. The north is for the most part hills, but the hills are composed of perfectly bare, black quartz sandstone, with no rivers or brooks among them, and the south is mainly a level waste of dry sand. Not more than a tenth of the soil is cultivable. In the neighborhood of the villages, which are mainly in the wadies, wheat, barley, etc., are cultivated. Camels and horses are reared in considerable numbers. Lions, leopards, hyenas, jackals, wild-cats, porcupines, vultures, ostriches, buzzards, etc., abound. The inhabitants are a mixed race, of brown color, in many respects resembling the negroes, but generally well formed. The original inhabitants belonged to the *Berber* family, but since the invasion of the country by the Arabs in the 15th c., the traces of this native N. African element have gradually become very faint. The language spoken is a corrupt mixture of Berber and Arabic. The people are far behind in civilization, and occupy themselves with gardening and the manufacture of the most indispensable necessities of life. Considerable trade is carried on by caravans between the interior of Africa and the coast. F. is the Phazania of the ancients, against which the Romans, under Cornelius Balbus, undertook a campaign about B.C. 20. During the classic period, as well as in the middle ages, it was governed by its own princes who were at first independent, but afterward became tributary to the pashas of Tripoli. In 1842, F. was conquered by the Turks, and is now attached to the govt. of Tripoli. Pop. estimated 75,000 to 150,000.

MURZUK, cap. of F. is a well-built town with broad streets. Merchandise valued more than \$100,000, £21,000 annually changes hands here, but of that amount the slave-trade supplies seven-eighths. Murzuk is now the great starting-point from the n. for the interior of Negroland. Pop. 3,000.

Compare Barth's *Travels in Central Africa* (Lond. 1857), also the descriptions given of Fezzân by Denham, Clapperton, Oudney, Richardson, Dr. Vogel, etc.

FIACRE, n. *fě-āk'r* [*F. fiacre*]: a hackney-coach; a hackney-coachman. The name is from St. F., anchorite of

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the 7th c., reputed son of a king of Scotland, who had his abode in the forest of Breuil. After his death, pilgrimages were made to his shrine, which had the repute of working miracles; and the demand for vehicles for this purpose caused the name F. to be given to coaches for hire.

FIANCÉ, n. *fě'äng-sä'* [F. *fiancé*, masc. *fiancée*, fem.]: betrothed; a person affianced. FIANCÉE, n. fem. *fě'äng-sä'*.

FIARS, n. plu. *fě'ërz* or *f'i'ërz* [Icel. *fé*; AS. *feoh*, cattle, price—connected with *fee*, *fief*, *feudal* (see FEUDAL). *Note.*—FIARS is intimately connected with the OE. AFFEER, which see]; in *Scotland* the average prices of the different kinds of grain of the growth of each county for the preceding crop, as fixed by the sentence of the sheriff, proceeding on the report of a jury summoned for the purpose, before whom the evidence of farmers and corn-dealers is produced. The values thus officially ascertained serve as a rule for ascertaining the prices of grain in all contracts where they are not fixed by the parties; and in many sales it is agreed to accept the rates fixed by the fiars. Ministers' stipends, also certain rents, so far as they consist of grain, and crown dues, are paid by the fiars prices of the county for each year. With a view to the latter, fiars, in former times, were struck in exchequer.—In England, weekly averages of *all* grain sold at public markets are ascertained and published in the *Gazette*, and this is without respect to the produce of particular counties.—See *Historical Account of the Striking of the Fiars in Scotland*, by George Paterson, Esq., Advocate, 1852.

FIASCO, n. *fě-äs'kō* [It. *fiasco*, a flask or bottle, a failure]: a failure of any kind. The term, borrowed from the Italian theatre, and now naturalized in France and Germany, and used occasionally by English writers, signifies primarily a failure to please on the part of an actor or singer, and is thus the opposite of *furore*; though why the word, which simply means a bottle, should come to be thus applied, is more than anybody knows. In Italy, it is not uncommon to hear an audience cry out, '*Old, old, fiasco*,' even when the singer has made only a single false note. It is suggested that *fiasco* originated from the name *Fiesco*, who conspired against the Dorias, Doges of Genoa in the 13th c., but who miserably failed; hence, any complete failure of an undertaking ushered in with high hopes.

FIAT, n. *f'i'ät* [L. *fīāt*, let it be done—from *fīō*, I am made]: a formal or solemn command; a decree; an order; in *Eng. law*, a short order or warrant of a judge for making out or allowing certain processes.

FIB, n. *f'ib* [It. *fiabbare*, to sing idle songs; OE. *fible-fable*, nonsense: perhaps adapted from *fable*]: a small lie; a falsehood: V. to tell a lie; to utter an untruth. FIB'ING, imp. FIBBED, pp. *f'ibd*. FIB'BER, n. one who lies. FIBSTER, n. *f'ib'stēr*, *familiarly*, a liar in a silly trifling way.

FI'BER: see MUSQUASH.

FIBRE.

FIBRE, or **FIBER**, n. *f'ibër* [F. *fibre*—from L. *fibra*, a fibre]: a strong tough thread; long stringy tissue, as wood-fibre or muscle-fibre; fine slender threads, or thread-like substances (see below). **FIBRED**, a. *-bërd*, having threads. **FIBRELESS**, a. without fibres. **FIBRIL**, n. *-bril*, a small fibre. **FIBRIL'Æ**, n. plu. *-bril'le*, in *bot.*, very small and fine roots, as in the lichens. **FIBRILLATION**, n. *f'ib'rîl-lû-shûn*, the state of being made up of fibres, or in appearance like fibrils. **FIBRIL'LOSE**, a. in *bot.*, covered with little strings or fibres. **FIBRIL'LOUS**, a. *-lûs*, pertaining to fine fibres; formed of small fibres. **FIBROUS**, a. *-brîs*, containing fibres; thread-like; possessing a structure separable into small threads or strings. **FIBROUS TISSUE**: see **TISSUES**. **FIBROUSNESS**, n. the quality or state of being fibrous. **FIBRIN**, or **FIBRINE**, n. *f'ibrîn*, a peculiar substance, found in animals and vegetables, which forms fibres and muscular flesh; the substance which forms the clot of blood (see below). **FIBRINATION**, n. *-û'shûn*, in *med.*, state of becoming fibrinous or having an excess of fibrin, as in inflammatory diseases. **FIBRINOUS**, a. *-brîn-ûs*, of or like fibrin. **FIBROID**, a. *f'ibroyd* [Gr. *eidos*, resemblance]: resembling simple fibre in structure; denoting a tumor in which the cell elements have assumed the appearance of fibres. **FIBROCELLULAR**, in *bot.*, applied to tissue composed of spiral cells. **FIBRO-PLASTIC** [F. *fibro-plastique*]: in *anat.*, a term applied to a morbid formation constituted of the elements of cellular tissue, transformed in part into fibre. **FIBROVASCULAR**, applied to tissues composed of mixed vessels, containing spiral and other fibres, found in all the higher plants. **FIBROUS-COAL**, variety of coal found in Great Britain, and distinguished by fibrous structure and silky lustre. **FIBROUS-SHELLS**, in *zool.*, shells of fibrous structure like the recent *Pinna* and the fossil *Inoceramus*. They consist of successive layers of prismatic cells, containing translucent carbouate of lime. *Note.*—The *fibrin* of flesh and the *gluten* of wheat are almost exactly the same thing.

FIBRE: term of very common use as applied to objects of a stringy or thread-like character, whether animal, vegetable, or mineral. Minerals are often described as of a fibrous structure or appearance, in which there is, however, no possibility of detaching the apparent fibres from the general mass, or in which they are inflexible and brittle if detached: but a more perfect example of mineral F. is found in *Amianthus*, a variety of **ASBESTUS** (q.v.). For the scientific use of F. with regard to the animal kingdom, see **MUSCLE**; for its scientific use with regard to the vegetable kingdom, see **VEGETABLE TISSUE**: **WOOD AND WOODY FIBRE**. In its more popular, but perfectly accurate use, F. includes the hair or wool of quadrupeds, the silken threads of the cocoons of silk-worms and other insects, the fibres of the leaves and of the inner bark of plants, and the elongated cells or hairs connected with the seeds of plants, the ordinary materials of cordage and of textile fabrics.

Of mineral substances, amianthus alone has been used for textile fabrics, and that only to a very limited extent. Animal and vegetable fibres have, from the earliest ages,

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supplied man with cordage and with cloth. How the invention took place can only be matter of conjecture.

The animal fibres used for textile purposes are chiefly of the two classes already mentioned—(1) the wool or hair of quadrupeds; (2) the silk of the cocoons of insects. To these may be added (3) the Byssus (q.v.) of mollusks, but this class contains only the Byssus of the PINNA (q.v.) of the Mediterranean, an article of ancient and high reputation, but more of curiosity than of use. The skins and intestines of animals, though sometimes twisted or plaited for various uses, can scarcely be reckoned among the fibrous materials afforded by the animal kingdom. For information regarding the fibres obtained from the cocoons of insects, see SILK AND SILKWORM. It is to the first class that the greater number of different kinds of animal F. used for textile purposes belong; and the wool of the sheep far exceeds all the rest in importance: see SHEEP WOOL. But the wool or hair of other quadrupeds also is to some extent used, as of the Goat (see GOAT: ANGORA), the Alpaca (q.v.), the Camel (q.v.), the Bison (q.v.), the Musk Ox (q.v.) the Yak (q.v.), and the Chinchilla (q.v.); all of which, except the last—and it has but a doubtful claim to be mentioned—are, like the sheep, ruminants. The hair of comparatively few animals is sufficiently long for textile purposes, or can be procured in sufficient abundance to make it of economic importance. The warmth of clothing depends much on the fineness of the hair, and on other characters in which wool particularly excels.

The useful vegetable fibres are far more numerous and various than the animal. They are obtained from plants of natural orders very different from each other; none of them, however, belonging to the class of acrogenous or cryptogamous plants. They are obtained also from different parts of plants. Those which are derived from exogenous plants are either the fibres of the inner bark (or BARK, q.v.), as flax, hemp, etc.; or hairs of the fruit, as cotton. The useful fibres of endogenous plants also sometimes belong to the fruit, as coir or cocoa-nut F., and the unimportant F. of cotton-grass. The spathe of some of the palms also is sometimes sufficiently fibrous and strong to be used for bags, etc., without separation of its fibres; the fibres of the interior of the stem of old cocoa-nut palms are sometimes used for coarse purposes; the fibrous character of the stems of the slender palms called rattans, of bulrushes, etc., fits them for wicker-work, for plaiting into chair-bottoms, and the like; the roots of the *Agaves* (q.v.) yield fibres useful for various purposes; but generally, the more valuable fibres obtained from endogenous plants are those of their leaves, either of the leaf-stalks—as Piassaba fibre and Gomuto or Ejoo F., both produced by palms—or of the blade of the leaf, as Pine-apple F., Pita Flax, New Zealand Flax, Bowstring Hemp, etc. The fibres of the leaves of endogens being parallel to each other, are easily obtained of sufficient length for economical purposes; while the reticulated fibres of the leaves of exogens, even if long enough, which is comparatively infrequent, cannot be separated for

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use. The *bast* fibres of exogens, however, are often of sufficient length, and easily separable. Their separation is accomplished generally by steeping in water or by frequent bedewing with water to cause a partial rotting of the other parts of the bast and of the bark which covers it. But the fibres of endogens being in general discolored and injured by this process to a much greater degree than those of exogens, mere mechanical means are usually preferred for their separation, such as beating, passing between rollers, and scraping. The fibres of many leaves are separated by scraping alone. The fibres of *fruits*, as cotton, exist in nature in a separate state, like the wool or hair of animals, and require merely to be collected and cleaned.

A complete enumeration of the kinds of vegetable F. applied to economical purposes would not be easy. Flax, Hemp, and Cotton have long had pre-eminence. To these have recently been added New Zealand Flax, Jute, Sunn or Sunn Hemp, Coir, Pita Flax, Abaca or Manilla Hemp, Bowstring Hemp, China Grass, Piassaba, and many others. New kinds are continually being brought under notice; and industrial exhibitions and industrial museums have beneficially contributed to this. New kinds, however, do not immediately command the attention that they deserve. 'If a new product is sent into the market,' says Dr. Royle, 'few of the regular customers will buy it, as they want that to which their machinery and manufactures are suited.' But for the judgment and enterprise of Mr. Salt, it might have been long ere alpaca wool had obtained its present place among the materials of manufactures; and there is much reason to think that many vegetable fibres, now little regarded, may yet in like manner be exalted to importance.—For the use of vegetable fibres in the manufacture of paper, see PAPER.

FIBROUS PLANTS. Of plants which yield fibres employed for economical purpose, the following is a list not complete, but practically useful. For many plants here enumerated, see their separate titles, or the natural orders. The most important are indicated by capitals.

I. EXOGENOUS PLANTS.

1. *Fibres of the Fruit.*

- NAT. ORD. *Malvaceæ*. COTTON, produced by species of *Gossypium*.
 ————— *Sterculiaceæ*. Silk-cotton, or vegetable silk, the produce of *Bombax villosum*, etc.
 ————— *Asclepiadaceæ*. The silk-like down of the seeds of Virginian Silk (*Asclepias Syriaca*).

2. *Fibres of the Inner Bark or Bast.*

- NAT. ORD. *Malvaceæ*. Deckanee Hemp (*Hibiscus cannabinus*).—Other species of *Hibiscus*, *Althæa cannabina*, *Sida abutilon*, etc.
 ————— *Sterculiaceæ*. A number of species of different genera; some of them cultivated to a small extent.
 ————— *Tiliaceæ*. JUTE (*Corchorus olitorius*, *C. capsularis*, etc.)—The bast of some trees of this family, as the Linden or Lime (*Tilia Europæa*, etc.) is used for mats, ropes, etc.: see BAST.
 ————— *Linaceæ*. FLAX, the produce of *Linum usitatissimum*.

FIBRIN.

- NAT. ORD. *Leguminosæ*.—SUNN, Jubbulpore Hemp, etc., the produce of species of *Crotalaria*.
 Spanish Broom (*Spartium junceum*).
 Bokhara Clover (*Melilotus arborea*).
 Dhunchee (*Sesbania aculeata*).
 Species of *Cytisus* (as Common Broom), *Butea*, *Parkinsonia*, *Bauhinia*, etc.
 ———— *Asclepiadaceæ*. Jetea (*Marsdenia tenacissima*).
 Yereum or Mudar (species of *Calotropis*).
 Virginian Silk (*Asclepias Syriaca*, *A. debilis*).
 Other species of several genera.
 ———— *Apocynaceæ*. Canadian Hemp (*Apocynum cannabinum*).
 ———— *Urticæ*. Common Nettle (*Urtica dioica*) and other species of *Urtica*.
 Species of *Bœhmeria*, one of them yielding CHINA GRASS Fibre.
 ———— *Cannabaceæ*. HEMP (*Cannabis sativa*).
 Hop (*Humulus lupulus*).
 ———— *Moraceæ*. The bark of some species of Fig.
 ———— *Conifereæ*. Inner bark and roots of some species of Pine and Fir.
 ———— Unknown Buaze.

II. ENDOGENOUS PLANTS.

- NAT. ORD. *Liliaceæ*.
 NEW ZEALAND FLAX, fibre of leaves of *Phormium tenax*.
 Bowstring Hemp, fibre of leaves of species of *Sansevieria*.
 Fibre of leaves of species of *Aloë* and of *Yucca*.
 ———— *Amaryllideæ*. Pita Flax, fibre of leaves of *Agave Americana*.
 Fibre of leaves of species of *Fourcroya*.
 ———— *Musaceæ*. Abaca or Manilla Hemp, and Plantain Fibre, obtained from leaves of species of *Musa*.
 ———— *Bromeliaceæ*. Pine-apple Fibre, Curratow, etc., fibres of leaves of species of *Bromelia*, etc.
 ———— *Pandanaceæ*. Fibres of leaves of Screw-pines.
 ———— *Palmaceæ*. COIR or cocoa-nut fibre, from husk of cocoa-nut. Fibre of cocoa-nut stem. Gomuto or Ejoo fibre, from leaf-stalks of Gomuto Palm (*Arenga saccharifera*).
 Piassaba, from *Attalea funifera* and *Leopoldinia Piassaba* (the Chiquichiqui Palm).
 Other fibres from leaf-stalks, etc., of many palms.
 ———— *Cyperaceæ*. Fibre from leaves of *Eriophorum cannabinum* (see COTTON-GRASS). Mats, chair-bottoms, etc., made of different *Cyperaceæ*.
 ———— *Gramineæ* or Grasses. Esparto (*Stipa tenacissima*).
 Moonja (*Saccharum munja*).

FIBRIN, or FIBRINE: an organic compound, occurring in animals and plants. In chemical composition it closely resembles albumen and caseine, and it was until recently believed that these three substances possessed a common radical, to which the name *proteine* was given, the *proteine* being regarded as the primary basis of all the tissues, of the body. Hence we frequently find F. described as one of the *proteine* bodies.

F. is distinguished from the allied substances, albumen and caseine, by its separation in a solid state, in the form of extremely delicate filaments or lamellæ from any fluid in which it is dissolved, very shortly after the fluid is taken from the organism. Animal F., which is of great physiological importance, occurs principally in the blood, the lymph, and the chyle. It results from the union of two albuminoids, fibrinogen, and fibrinoplastic substances, which exist separately in the blood. To obtain F., beat or stir the

FIBRINOGEN—FIBROIN.

blood with a bundle of twigs, to which the F. adheres in strings. The impure F. thus obtained is then rinsed with water, boiled with alcohol and ether,—to remove fatty matters—and dried. In healthful venous blood, it scarcely ever amounts to 3 in 1,000 parts, its average quantity being 2·3. Small, however, as its amount is, it varies more than any other constituent of the blood—and in acute inflammatory diseases sometimes exceeds its average by five or six times. Moreover, arterial blood contains more F. than venous blood. In the lymph and chyle, it occurs in considerably less quantity than in the blood. In inflammatory exudations, we find F. in the contents of the serous cavities—for example, of the pleura and peritoneum—and on the mucous membrane (as in croup); in these cases, it occurs usually in a state of spontaneous coagulation. There are good physiological reasons for believing that F. is formed from albumen, and not directly from the food; and as F. contains a little more oxygen than albumen, it has been inferred that it is formed from the latter by a process of oxidation. As, however, more F. is found in the blood in pneumonia—when a considerable portion of the lungs is rendered impervious to air—than in almost any other disease, we are inclined to adopt the opposite hypothesis, that the augmentation of the F. in inflammatory blood is caused by an insufficient supply of oxygen. When oxygen is abundantly introduced into the blood, the F. rapidly undergoes further transformations: on the other hand, when, in consequence of impeded respiration, the quantity of oxygen conveyed to the blood is not sufficient to effect the further normal oxidation or transformation of the F., we have an accumulation of that constituent in the circulating fluid. It has, however, been a disputed question, whether F. is produced in the elaboration or in the disintegration of the tissues. For the discussion of this subject, and of other points connected with F., see any standard work on Physiological Chemistry.

The substance forming the mass of flesh or muscular tissue was formerly regarded as identical with coagulated blood-fibrine. The two substances are, however, chemically distinct, and the muscle-F. will be described under its new chemical name, SYNTONIN (from *sunteinēin*, to contract or render tense).

FIBRINOGEN, n. *fī-brīn'ō-jěn* [Eng. *fibrin*, and Gr. *gennōō*, I produce]: one of the two substances in blood which produce fibrin, the other substance being named 'fibrinoplastic' or 'paraglobulin'. **FIBRINOGENOUS**, a. *fī-brīn'ō-jē-nūs*, uniting with paraglobulin to form fibrin. **FIBRINOPLASTIC**, a. *fī-brīn-ō-plās'tik* [Eng. *plastic*]: uniting with fibrinogen to form fibrin. **FIBRINOPLASTIN**, n. *-plās-tīn*, another name for paraglobulin; a substance supplied from the blood.

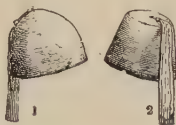
FIBROIN, or **FIBROINE**, *fī-brō-īn*: $C_{71}H_{107}N_{24}O_{25}$, or $C_{15}H_{23}N_5O_6$. Both these formulæ have been given to fibroin, which constitutes the chief part of the fibre of silk. It is extracted by digesting the silk with water, under a



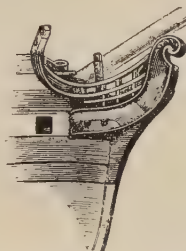
Ferns.—A, Tassel variety of Male Fern (*A. filix-mas*, var. *Cristata*); B, Fertile frond of Royal Fern (*Osmunda regalis*).



Falcon and Fetlock (Badge of Edward IV.).



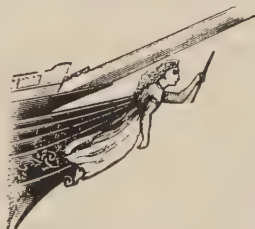
1, Egyptian Fez; 2, Turkish Fez.



Fiddle-head.



Fetiches of Dahomey.



Figurehead.



a, Fibula; b, Tibia; c, Part of femur; d, Patella.
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Fibrous Root.



Fiddle-shaped Leaf.

FIBROLITE—FICHTE.

pressure of three atmospheres, and then removing the fat with ether; it is a white mass. Boiled with dilute sulphuric acid, it yields leucine, tyrosine, and glycocine. It is the principal constituent of cob-webs and the horny skeletons of sponges.

FIBROLITE, n. *fī'brō-līt* [L. *fibra*, a fibre; Gr. *lithos*, a stone]: in *mineral.*, monoclinic, transparent or translucent mineral, occurring in gneiss, mica schist, and related metamorphic rocks in Bohemia, Bavaria, and parts of the United States. Color, brown or olive-green. Fibrolite was much used for stone implements in w. Europe in the Stone Age.

FIBULA, n. *fīb'ū-lā* [L. and It. *fībūla*, a buckle]: the outer and smaller bone of the leg; in *archæol.*, a kind of brooch or pin; in *mason.*, iron cramp by which stones are fastened together; in *surg.*, needle for sewing up wounds. **FIBULAR**, a. *-lēr*, pertaining to or situated near the *fibula*. **FIBULATED**, a. *-lā-tēd*, resembling a brooch or buckle.

FICHTE, *fīch'tēh*, IMMANUEL HERMANN: professor of philosophy at Tübingen: 1797, July 18—1879, Aug. 8; b. Jena; son of Johann Gottlieb F. He early applied himself to philosophical studies, being attracted by the later views of his father, which he considered essentially *theistic*. He also attended the lectures of Hegel, but felt averse to his pantheistic tendencies, and leaned more to Schleiermacher and Schelling. Occupied at first as a teacher, F. was appointed prof. of philosophy in Bonn 1836, and 1842–63 held a chair in the Univ. of Tübingen. His chief works are—*Beiträge zur Charakteristik der neuern Philosophie* (1841), *Grundzüge zum Systeme der Philosophie* (1839–47); *System der Ethik* (1850); *Anthropologie* (1856); *Psychologie* (1864); *Vermischte Schriften* (1869), etc. He suggested meetings of philosophers similar to those held by physicists; and at one at Gotha 1847 he delivered an address *On the Philosophy of the Future* (Stuttg. 1847). The great aim of his speculations has been to find a philosophic basis for the personality of God, and for his theory on this subject he has proposed the term *Concrete Theism*, to distinguish it alike from the abstract theism which makes God almost an unreality—a barren aggregate of lifeless attributes; and on the other hand, from the all-absorbing pantheism of Hegel, which swallows up the human and the divine in its own inapprehensible totality. F.'s *Zur Seelenfrage* was translated by J. D. Morell (*Contributions to Mental Philosophy*, 1860). Later works were *Die Theistische Weltansicht*, 1873; *Fragen und Bedenken* (1876). During the movements of 1848, he issued several political tracts. From 1863 onward he lived in retirement at Stuttgart, where he died. The principle of F.'s politics is not unlike Dr. Arnold's maxim. He holds that there is only one kind of real conservatism, that of constant well-planned reform; and that all revolution consists either in attempts to precipitate prematurely the future, or to go back to ideas that are effete, the last being only the chrysalis form of the first. The state, 'according to the idea of benevolence,' belongs to the future,

FICHTE.

The regeneration of Christianity would consist in its becoming the vital and organizing power in the state, instead of being occupied solely, as heretofore, with the salvation of individuals. To this recent school of philosophy belong Weisse, Chalybæus, Wirth, and others.

FICHTE, JOHANN GOTTLIEB: 1762, May 19—1814, Jan. 27; b. Rammenau, Upper Lusatia: illustrious German philosopher. His earliest years were marked by a love of solitary musing and meditation. When a mere child he was wont to wander forth to upland fields, that he might enjoy the pleasure of gazing into the illimitable distance. In 1775, he was placed at the gymnasium of Pforta, near Naumburg; and 1780 he entered the Univ. of Jena, where he applied himself first to theology, afterward to philosophy. During 1784–88, he supported himself in a precarious way as tutor in various Saxon families. Subsequently, he went to Zurich in a similar capacity, where he made the acquaintance of the excellent lady who afterward became his wife, Johanna Maria Rahn. In 1791, F. obtained a tutorship at Warsaw, in the house of a Polish nobleman. The situation, however, proved disagreeable, and was given up by the fastidious philosopher, who went to Königsberg, where he had an interview with Kant, of whom he had become an ardent disciple. Here he wrote, 1792, his *Kritik aller Offenbarung* (Critique of all Revelation), which he showed to that philosopher, who praised it highly, but still maintained a certain air of reserve toward the enthusiastically earnest author, which pained the latter greatly. At Königsberg, F. was reduced to such straits for want of the means of subsistence, that he was forced to ask the loan of a small sum of money from Kant, which the latter was stoical enough to refuse. Things were now at the worst with F., and of course—according to the old adage—they began to mend. He entered the delightful family of the Count of Krokow, near Danzig, as tutor; was enabled to marry; and 1794 was appointed to the chair of philosophy at Jena, where he commenced to expound with extraordinary zeal his system of transcendental idealism. F., in fact, *preached* his philosophy as if he believed its reception essential to the salvation of his hearers. In 1795, he published *Wissenschaftslehre* (Doctrine of Science), in which he clearly broke away from Kant, whose speculations did not seem to him sufficiently thorough, or, as Englishmen would say, *idealistic*. Indeed, as early as 1793, writing to Niethammer, he says: ‘My conviction is, that Kant has only *indicated* the truth, but neither unfolded nor proved it.’ An accusation of atheism, which F. fervidly but fruitlessly refuted, cost him his chair 1799. In the previous year, he published his *System der Sittenlehre* (System of Ethics, Jena 1798), considered by many his most mature work. He now removed to Berlin, where he delivered lectures on philosophy to a select auditory. In 1800, appeared *Ueber die Bestimmung des Menschen* (On the Destiny of Man). In 1805, he obtained the chair of philosophy at Erlangen, with the privilege of residing at Berlin in the winter. Here he delivered his celebrated lectures, *Ueber das Wesen des Gelehrten* (On the

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Nature of the Scholar, Berlin 1805-6). In the same year, appeared *Grundzüge des gegenwärtigen Zeitalters* (Characteristics of the Present Age); and 1806, *Anweisung zum seligen Leben oder die Religionslehre* (The Way to the Blessed Life, or the Doctrine of Religion). But F. was a patriot as well as a philosopher. The victories of Napoleon at Auerstadt and Jena drew forth the famous *Reden an die Deutschen* (Addresses to the Germans). These addresses were full of the most exalted enthusiasm. F. 'laments that his age has denied him the privilege accorded to Æschylus and Cervantes, to make good his words by manly deeds.' The Prussian king appreciated the zeal of the eloquent metaphysician, and, on the restoration of peace, requested him to draw up a new constitution for the Berlin University. In 1810, the univ. was opened, with a host of brilliant names, F., Wolff, Müller, Humboldt, De Wette, Schleiermacher, Neander, Klaproth, and Savigny. By the votes of his colleagues, F. was unanimously elected rector. Here, as at Jena, he labored with unremitting energy for the suppression of all those customs which he deemed barbarous in themselves, and incompatible with the true idea of a scholar. In 1813, the war of independence broke out, and the hospitals of the Prussian capital were soon crowded with patients. F.'s wife was one of the first who offered her services as a nurse. For five months, she tended the sick with all the patient tenderness and devotion of her nature. At last, she was seized with fever, 1814, Jan. 3. After a fearful struggle, she recovered; but her husband caught the infection, and in spite of all remedies, sank under its influence, and died.

It is difficult to speak calmly of Fichte. His life stirs one like a trumpet. He combines the penetration of a philosopher with the fire of a prophet, and the thunder of an orator; and over all his life lies the beauty of a stainless purity. See *Fichte's Leben und literarischer Briefwechsel* (published by I. H. Fichte, 2 vols. 1831; 2d ed. 1862); and Dr. William Smith's *Memoir* (Lond. 1848). The fundamental notion of the idealism set forth in F.'s writings, at least in the earlier of them, is the sole reality of the *Ego* or *I*, which posits both itself and the *Non-ego*, or Not-I. (The phrase 'to posit,' it ought to be observed here, signifies in German Metaphysics, to present to the consciousness. Hence, when it is said that the *ego* posits itself, the meaning is, that the *ego* becomes a fact of consciousness, which it can become only through the antithesis of the *non-ego*.) Under this *ego*, however, must not be understood, according to the usual misapprehension, the human and finite, but the 'absolute subject-objectivity' (*absolute subject-objectivität*), the eternal, universal reason. The *ego* is the absolutely productive, which, however, would not attain to consciousness of itself—i.e., of its infinite spontaneous activity, did it not at the same time place in contrast to itself, and as an impediment (*anstoss*) and limit to its activity, the non-*ego*—i.e., the objective world, or nature. The *ego*, so far as it is determined by the non-*ego*, is the intelligent *ego*, and, as such, the subject of theoretical science;

FICHELGEBIRGE.

the ego, on the other hand, as determining the non-ego, is the subject of practical science. Freedom, absolute, spontaneous activity, for its own sake, is not with F., as with Kant, the condition and pre-supposition of moral action, but is itself the highest expression of the problem of the moral law. To realize this self-activity, however, the ego requires an external world of objects, in order that in them as limits it may become conscious of its own activity. To this idealistic system of ethics it has been plausibly—some think unanswerably—objected that it asserts that the non-ego is required as the condition of morality, and at the same time represents the removal of this condition as the aim of moral effort. With respect to the idea of right, F.'s theory of freedom, in its fundamental principles, attached itself to the Kantian theory of freedom as the innate and primitive principle of right. Generally speaking, F. makes that which, from the stand-point of ordinary consciousness, we call the world, merely a product of the ego; it exists only through the ego, for the ego, and in the ego. F. himself afterward modified or extended his system, to bring out more prominently the *theistic* character of his metaphysics. The transition to this later stage of F.'s philosophy is seen in *Bestimmung des Menschen* (Destination of Man). It arose from the intense religiosity of his nature. F. was essentially a worshipping nature, and though he never ceased to be a philosopher, the untiring aspiration of his later years was to realize in his own way the belief of the great Jewish lawgiver: 'The eternal God is thy refuge, and underneath are the everlasting arms.' A popular exposition of his philosophy is given in his *Anweisung zum seligen Leben*. It is set forth in a strictly scientific manner in the lectures in the *Nachgelassene Werke*, edited by I. H. Fichte (3 vols. Bonn 1834-5), in which his *Speculative Logik* and his revised theory of right and morals are particularly deserving of attention. Although F. never, strictly speaking, formed a school, and though his system has been adopted by only a few, such as J. B. Schäd, Mehmel, Cramer, Schmidt, and Michaelis, his influence upon the subsequent development of German philosophy has been very important. F.'s collective works have been published by his son, I. H. Fichte. See the admirable little work on F. by Prof. Adamson (1882). His popular works have been translated into English by Dr. William Smith; their titles are—*The Destination of Man*, *The Vocation of the Scholar*, *The Nature of the Scholar*, *The Way to the Blessed Life*, and *The Characteristics of the Present Age*.

FICHELGEBIRGE, *fich' tēl gā-bīr'gēh*: range of pine covered mountains on the n. frontier of Bavaria, from which the principal ranges of Germany diverge. It extends from the vicinity of Baireuth n.e. 36 m. to the frontier of Bohemia, where it is merged into the Erzgebirge which continues in the same direction. The Main, Naab, Eger, and Saale rivers rise among its summits, the highest of which are the Ochsenkopf (ox-head) 3,397 ft., and the Schneeberg (snow mountain) 3,450 ft. The range receives its name from the great pine forests which cover it.

FICHU—FICTION.

FICHU, n. *f'ish'ó* [F. *fichu*—from *ficher*, to fix on]: a small handkerchief worn on the neck, or on the neck and over the shoulders.

FICINO, *fe-chē'nō*, **MARSILIO**: illustrious philosopher of the Italian Platonic school: 1433-99; b. Florence; son of the principal physician of Cosmo de' Medici. To the liberality of this prince he owed the classical culture which inspired his career. At the suggestion of Cosmo, F. undertook the translation of Plotinus, Iamblichus, Proclus, and Porphyry, besides a Latin but by no means literal version of Plato. In 1463, he was appointed by Cosmo pres. of a classical soc. or acad., founded 1440, having for its aim the diffusion of the Platonic doctrines, which F. held to be the basis and confirmation of the Christian system. On the death of Cosmo, F. was favored by that prince's grandson, Lorenzo de' Medici; and at the mature age of 40, he entered the priesthood. His theological doctrine, while undoubtedly sincere, is a strange medley of incongruous views, the natural result of his attempt to fuse the philosophy of Plato with the Christian creed. F.'s collected works, published at Basel (2 vols. f. 1491), consist of translations from the Greek philosophers, and original metaphysical and theological compositions, among which are the *Theologica Platonica*, *De Religione Christiana*, the Latin epistles, and a Commentary on the Epistles of St. Paul.

FICKLE, a. *f'ik'i* [AS. *ficol*, vacillating: Ger. *ficken*, to move quickly to and fro: comp. Gael *faicill*, caution, care]: apt to change in mind or purpose, generally associated with minds of a light and trifling character; wavering; unstable; of a changeable mind; variable. **FICKLENESS**, n. *f'ik'l-nēs*, the state of being fickle; inconstancy; uncertainty.—**SYN.** of 'fickle': capricious; inconstant; irresolute; unsettled; vacillating; unsteady; changeable; changeful; mutable.

FICO, n. *fē'kō* [It. *fico*, a fig—from L. *ficus*]: in *OE.*, a fig; an act of contempt expressed by raising the arm and snapping the fingers = a fig for you.

FICOIDEÆ, n. *fī-koy'dē-ē* [L. *ficus*, fig; Gr. *eidos*, form, appearance]: in *bot.*, name given by Jussieu to the order called by Lindley *Mesembryaceæ*.

FICTILE, a. *f'ik'til* [L. *fictilis*, earthen—from *fictus*, formed or shaped: It. *fittile*]: molded into form by the potter's art; pertaining to pottery. **FICTOR**, n. *-tēr*, an artist who works in wax, clay, or other plastic material.

FICTION, n. *f'ik'shūn* [F. *fiction*—from L. *fictiōnem*, a making, a feigning—from *fictus*, feigned, invented: It. *fizione*]: the act of inventing; that which is feigned or invented; a falsehood; a fable; novel literature. **FIC TIONIST**, n. a writer of novels. **FICTITIOUS**, a. *-tish'ūs*, feigned: not real; false. **FICTITIOUSLY**, ad. *-lī*. **FICTITIOUSNESS**, n. the state of being fictitious.—**SYN.** of 'fiction': fable; fabrication; parable; novel; romance; allegory; invention; falsehood;—of 'fictitious': artificial; counterfeit; spurious; supposititious; feigned; unreal; false.

FICTION—FICTION OF LAW.

FICTION: see NOVELS.

FICTION OF LAW: 'a supposition of law that a thing is true, which either is certainly not true, or at least is as probably false as true.'—Erskine, *Inst.* iv. 2, 38. Fictions have existed in all legal systems, and must be regarded as a species of legal falsehood, understood to be such, resorted to as enabling individuals who, by the strict letter of the law, would have been excluded from obtaining redress of evils, to procure redress. Two general maxims regulate the application of legal fictions—viz., that no F. shall be allowed to operate a wrong, and that no F. shall be admitted which in the nature of things is impossible. The Roman form of judicial procedure abounded with fictions, by which alone, in many cases, a party aggrieved could enforce his right. Thus, an heir, unjustly disinherited, by the *querela inofficiosi testamenti*, feigned that his father had been mad. A stranger in Rome, who had been robbed, could not obtain restitution without the *fictio civitatis*, whereby he feigned himself a citizen. Many of the fictions existing in Rome have found a counterpart in modern systems; thus, the *fictio longe manus*, whereby lands at a distance were feigned to be delivered, resembles an English feoffment at law; in like manner, the *fictio traditionis symbolice* of keys of a warehouse to give possession of the articles contained therein, and of a deed in confirmation of the covenants contained therein. The *fictio unitatis personarum* was the original of the Scottish fiction, that the heir is *eadem persona cum defuncto*. But in no system of laws have fictions been so liberally adopted as in that of England. It is by means of fictions alone that the original limited jurisdiction of the courts of queen's bench and exchequer has been extended to ordinary suits. In the latter court, every plaintiff assumed that he was a debtor to the crown, and was debarred from discharging his obligation by the failure of the defendant to satisfy his demand; in the former, it was assumed that the defendant had been arrested for some supposed trespass which he had never in fact committed. The fictitious characters of John Doe and Richard Roe long contributed to make the action of ejectment famous. And though these fictions have disappeared before the ruthless hand of modern legislation, yet to this day, in an action at the instance of a father for the seduction of his daughter, damages can be awarded only on the assumption that she was his servant, and that he has suffered pecuniary loss by deprivation of her services. In chancery, the whole doctrine of uses and trusts is based on a fiction. Perhaps the best explanation of the introduction of fictions into legal systems is in Dr. Colquhoun's *Summary of the Roman Civil Law*, 2027. It involves, he says, 'less difficulty to adhere to known and admitted forms, and gradually to accommodate them to the changed state of society, than to upset all the incidents connected with them by a sudden change, which must ever tend to unsettle the law and practice of the courts. All nations have therefore found it more desirable to let the one glide into the other,

FICTIVE—FIDEICOMMISSUM.

than to adopt any abrupt measure which might disturb the practice and effect of former decisions.'

FICTIVE, a. *fik'tiv* [F. *fictif*, fictitious—from L. *fictivus*—from *fictus*, invented]: feigned; pretended or unreal.

FICTIVELY, ad. *-li*, in a pretended or feigned manner.

FICTOR, n.: see **FICTILE**.

FICUS: see **FIG**.

FID [from Lat. *findere*, *fidi*, to divide]: instrument for splicing ropes. It is a large pointed pin with an eye at the thick end, of iron or lignum vitæ, used by sailors in separating and interlacing the strands of which the rope is composed. Fid is also a small thick lump of anything; a bar or pin of metal or wood used to support or steady anything; a plug of oakum for the vent of a cannon. **MAST-FID**, bolt inserted through the bottom of a ship's topmast or top-gallant-mast, with ends resting on the trestle-trees sustained by the head of the lower mast or topmast. Unless the mast-fid be withdrawn, the supported mast cannot be lowered.

FIDALGO, n. *fê-dâl'gô* [Port.]: nobleman or one royally descended: see Spanish **HIDALGÓ**.

FIDDEMIN: one of the handsomest villages of the Fayûm, inhabited by a Mussulman and Coptic population. It is surrounded by fruit trees, and is remarkable for a large olive, supposed to be the original one planted in Egypt, and yielding annually 268 pounds of olives.—Clot Bey, *Aperçu générale sur l'Égypte* (8vo, Paris 1840), I. 213.

FIDDLE, n. *fîd'l* [Ger. *fiedel*; Dut. *vedele*, a fiddle—from mid. L. *vitula*, a violin: L. *fîdes*, any stringed instrument]: a violin (q.v.). **FIDDLER**, n. *fîd'lër*, one who plays on a fiddle. **FIDDLE-BLOCK**, in *naut.*, a long block having two sheaves of different diameters in the same plane, not in parallel planes, as in a double-block; a viol, or long tackle block. **FID'DLE-FAD'DLE**, n. *fîd'l* [a word directly imitative of the light rapid movements of the fiddle-bow]: a trifling or fanciful matter; trifling talk: **ADJ.** trifling; making a bustle about nothing. **FIDDLE-FISH**, the angel-fish, from its resemblance to a fiddle. **FIDDLE-GRASS**, in *bot.*, *Epilobium hirsutum*. **FIDDLE-HEAD**, in *naut.*, the ornamental carving at the bows of a ship, when it is made in the form of a scroll or volute similar to the end of a fiddle. **FID'DLESTICK**, n. the bow for playing a fiddle; a term employed for a thing below notice. **FIDDLE-WOOD**, genus *Citharexylum*. From the fact that the French *fidèle* (applied to one species from its durable qualities) has become corrupted into Eng. *fiddle*, has arisen the erroneous notion that the wood of this genus is suitable for making violins. The error has been perpetuated also in the Latin name, which means harp-wood. **FIDDLER'S-FARE**, meat, drink, and money. **FID'DLING**, a. trifling: **N.** the playing on a fiddle. **TO PLAY FIRST FIDDLE**, to act as head man or chief. **TO PLAY SECOND FIDDLE**, to act a subordinate or inferior part.

FIDEICOMMISSUM, *fîd'ê-i-kôm-mîs'sûm*, in the Civil Law: conveyance of property in trust to be transferred to

FIDEJUSSION--FIDONIA.

a third person named by the truster. *Fideicommissa*, when introduced, were not supported by the law. The performance of them depended, therefore, on the conscience of the party intrusted, and they were consequently often not carried out. They were adopted originally for the purpose of conveying property either where a party, from the circumstances of the case, as inability to procure the proper number of witnesses, was prevented from executing a will; or where he desired to benefit those who, by law, were precluded from taking the property. To effect this purpose, an actual conveyance was made to a friend, coupled with a request that the property should be transferred to another. *Fideicommissa* having thus been introduced for a special purpose, were by degrees extended to conveyances of the whole inheritance, and finally were used for the purpose of settling estates in a particular order of succession, forming the earliest instance of entails (q.v.). *Fideicommissa* received the sanction of positive law first in the reign of Augustus, by whom authority was given to the pretor to enforce the performance of these fiduciary obligations.—*Institutes*, ii. 23, s. 1. Emperor Claudius subsequently extended this authority to the consuls and presidents of provinces. *Fideicommissa* were either *particular* or *universal*, the former a bequest of a particular subject, or a part only of the inheritance; the latter comprehending the whole estate.—In *Holland*, the principles of the civil law as to *fideicommissa* form an important branch of the law in regard to landed estates. *Grotius Dutch Jurisprudence*, by Herbert, b. ii. c. 20.

FIDEJUSSION, n. *fī-dē-jū'shūn* [L. *fides*, faith; *jubeo*, I order]: state or act of being bound as surety for another; suretyship; bail. **FIDEJUS'SOR**, *jūs-ēr*, surety; one bound for another.

FIDELITY, n. *fī-dēl'ī-tī* [F. *fidélité*—from L. *fidélitatem*, faithfulness—from *fīdēs*, faith: It. *fidélita*]: faithfulness; integrity; veracity; honesty.—**SYN.**: constancy; steadiness; steadfastness; firmness; stability; permanence; faith; loyalty; fealty.

FIDES, n. *fī-dēz* [L.]: in *myth.*, the goddess of Faith and Honesty; in *astron.*, see **PLANETOIDS**.

FIDGET, v. *fīj'ēt* [Icel. *fika*, to climb up nimbly; Sw. *fika*, to hunt after; Swiss, *fitschen*, to flutter to and fro; Dut. *ficken*, to switch; Ger. *fick-facken*, to fidget]: to make light involuntary movements; to be unable to keep still: N. restless agitation. **FIDGETINESS**, n. *-ī-nēs*, the quality or state of being fidgety; nervous restlessness or uneasiness; a fidgety person. **FIDG'ETING**, imp. **FIDG'ETED**, pp. **FIDGETY**, a. *fīj'ēt-ī*, restless; uneasy; impatient. **FIDG'ETS**, n. plu. restlessness: uneasy and irregular motions, arising from some cause of irritation which requires muscular action for its relief.

FIDICULA, *fī-dīk'ū-la*: small musical instrument in the shape of a lyre.

FIDONIA, n. *fī-dō-nī-a*: in *entom.*, genus of Lepidoptera, belonging to the family *Geometridæ* or geometers, formerly

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called *Bupalus*. *F. piniaria* (the bordered white moth) is a beautiful insect having its wings on the upper side of a dusky-brown color, and adorned with pale yellow spots. The larvæ feed on fir.

FIDUCIAL, a. *fī-dū'shī-āl* [L. *fiduciā*, confidence—from *fidō*, I trust: It. *fiduciale*]: confident; undoubting; of the nature of a trust. **FIDUCIALLY**, ad. -lī. **FIDUCIARY**, a. -ēr-ī, unwavering; held in trust: N. one who holds anything in trust; one who depends on faith without works. **FIDUCIAL MARK**, a standard or reference mark on an instrument.

FIE, int. *fī* [Icel. *fý*: Ger. *pfui*: W. *ffi*]: an exclamation of dislike or disapprobation.

FIEF, n. *fīf* [F. *fief*, a fief, a tenure—from mid. L. *feodum*, or *feudum* (see **FEE**)]: land held of a superior on condition of military service; land held of a superior: see **FEUDAL SYSTEM**. *Note*.—Littré derives from O.H.G. *fihu*, or *feho*, possessions, goods, cattle—see **SKEAT**.

FIELD, n. *fīld* [Ger. *feld*: Dut. *veld*, the open country, soil: prov. Dan. *fald*, an inclosed portion of cultivated soil]: a piece of land inclosed for tillage; the open country; a battle-ground; room; space; the entire space within which objects are seen by a telescope or microscope. In *her.*, the surface of the shield; the blank space on which figures are drawn or projected; so called, according to some, because it represents the field of battle on which the achievements or charges represented on it are supposed to have been gained. In blazoning, the tincture or metal of the field must be the first thing mentioned. **FIELD'ED**, a. in *OE.*, in the field of battle. **FIELDING**, the act of catching or stopping and returning to the wicket-keeper balls hit by the batsmen; in *vinegar manuf.*, exposure to the open air and sun of malt-wash, or gyle in casks, in order to promote its acetification. **FIELD-ALLOWANCE**, daily sum of money granted to officers to meet extra expenses while on active services. **FIELD-BOOK**, note-book used in surveying. **FIELD-BUG** in *entom.*, the genus *Pentatoma*. The name is intended to distinguish it from the bed-bug. **FIELD-COLORS**, small flags of about eighteen inches square used for marking out the ground for squadrons and battalions. **FIELD-CORNET**, magistrate of a township in the Cape Colony. **FIELD-DAY**, a military review; a gala-day. **FIELD-DUCK**, in *zool.*, *Otis tetrax*, or little bustard. It is a native of France. **FIELD-GLASS**, *glās*, a telescope; a binocle; the lens usually interposed between the object-glass and eye-glass of a microscope, which, receiving the diverging rays from the former, before they form an image, contracts the dimensions of the image, and increases its brightness, so as to render it of a proper size and degree of distinctness for being viewed by means of the eye-glass: see **FIELD OF VIEW**: **MICROSCOPE**. **FIELD-MADDER**, in *bot.*, a common modern book-name for *Sherardia arvensis*, a plant belonging to the order *Rubiaceæ*. **FIELD MARSHAL**, -mār'shāl, highest rank of general officers in the British and some foreign armies. In the British army, it is a special honor given to very few

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officers, and conferred only by selection, on the ground either of distinguished service or of royal birth. When unemployed, the field-marshal has no higher pay than any other general. The equivalent rank in the British navy is that of admiral of the fleet. Formerly, a captain-general was occasionally appointed, who had rank higher even than a field-marshal. **FIELD-MOUSE**, popular name for certain species both of **MOUSE** and of **VOLE**: see these titles. **FIELD-OFFICER**, one competent to command a whole battalion—viz., major, lieutenant-colonel—in distinction from one of those merely intrusted with company duties, as a captain, lieutenant, sub-lieutenant. **FIELD-PIECE**, a cannon mounted on a wheeled carriage for moving about from place to place in the field. **FIELD-SPORTS**, diversions in the open country, as in shooting and fishing. **FIELD-TRAIN**, department of the artillery, consisting of commissaries and conductors of stores, responsible for safe custody of the ammunition, for formation of proper depôts of shot, etc., between the front and the base of operations, and that a due proportion shall be constantly at the service of each gun during an engagement. **FIELD-VOLE**, in *zool.*, *Arvicola agrestis*, or short-tailed field-mouse. **FIELD-WORKS**, intrenchments and other temporary fortifications thrown up by an army in the field, either as protection from a hostile force, or to cover an attack on some stronghold: see **FORTIFICATION**. **FIELD OF BLOOD**: see **ACELDAMA**. **FIELD OF ICE**, a large mass of floating ice in the sea or large river. **FIELD OF VISION** or **VIEW**, the whole space within which objects can be seen through an optical instrument; more strictly, the space within which the image of an object may be seen by whole pencils. That part of the image which is seen by partial pencils of the light from the object speculum or lens is called the *ragged edge*, and usually a diaphragm is employed to cut it off altogether from the view of the observer. **TO KEEP THE FIELD**, to continue in active operations, as an army. **TO TAKE THE FIELD**, to commence active operations against an enemy. **IN THE FIELD**, employed in a campaign against an enemy.

FIELD, *fēld*, **CYRUS WEST**: 1819, Nov. 30—1892, July 12; promoter of submarine telegraphy; b. Stockbridge, Mass.; son of David Dudley F. (q.v.). He was educated in his native town, became a clerk in New York 1834, and began manufacturing paper 1840. In 1853 he partially retired from business, and spent several months in S. American travel. The same year, being asked to furnish the money to build a land-telegraph across Newfoundland to expedite news from Europe, he conceived the idea of stretching a line across the Atlantic ocean. He consulted with his brother David Dudley F., Peter Cooper, Marshall O. Roberts, Moses Taylor, and Chandler White, and, receiving assurances of financial support from them, went to Newfoundland 1854, and obtained from its legislature the exclusive right for 50 years of landing telegraph cables from Europe and America on that island. Returning to New York he organized the New York, Newfoundland and London Telegraph Company with the

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above gentlemen, of whom Messrs. Cooper, Roberts, Taylor, and White, agreed to contribute \$20,000 each, and after soliciting financial aid in England, he subscribed for a fourth interest. Within two years lines were completed from New York across Newfoundland. In 1855 a cable designed to extend from Newfoundland to Cape Breton Island was lost in a storm while being laid, but a second cable was successfully laid the next year. This became inoperative within a short time. In 1856 he organized the Atlantic Telegraph Company in London, for which he furnished over one-fourth the capital, and after several attempts and failures telegraphic communication between the two continents was established 1866, July 27 (see ATLANTIC TELEGRAPH). In connection with this work he made over 50 passages across the Atlantic, during nearly 13 years of anxious, unceasing toil. Congress unanimously voted him a gold medal and the thanks of the nation, and unusual honors would have been conferred upon him had he been a British subject. In 1867 he received the grand medal—its highest prize—of the Paris Exposition. In 1869 he was the representative of the New York chamber of commerce at the opening of the Suez canal, and subsequently was interested in laying cables between Europe, India, China, Australia, the West Indies, and S. America; also in the construction of the Third ave. elevated railroad in New York, and the management of the Wabash St. Louis and Pacific railroad. He made a trip around the world 1880, erected a monument to Maj. André, on his property at Tarrytown, N. Y., which was first partially then wholly destroyed with dynamite by persons unknown; and in conjunction with his brothers prepared and gave a public park and a library to the town of Stockbridge, and built there a church in memory of his parents. The closing years of a notable and useful career were embittered by the loss of most of his fortune in Wall street in 1890, and the disastrous and criminal failure of his son in 1891, which swept away nearly all that he had.

FIELD, DAVID DUDLEY, D.D.: 1781, May 20—1867, Apr. 15; b. East Guilford, Conn.: Congl minister. He graduated at Yale 1802, studied theol. with the Rev. Charles Backus, was licensed to preach by the New Haven Congl. Assoc. 1803, Sep.; was ordained pastor of the Congl. Church, Haddam, Conn., 1804, Apr. 11, and remained there till 1818. He then made a missionary tour through w. N. Y., and in 1819, Aug., was installed pastor of the only church in Stockbridge, Mass. After a faithful service of 18 years there, he returned to his Haddam congregation, and ministered there till 1844, when on the division of the congregation he went to Higganum; where he officiated 7 years, afterward making his permanent home in Stockbridge. He was vice-pres. of the Conn. Hist. Soc., and corresponding member of the Mass. and Penn. Hist. Socs. He published *History of the County of Berkshire* (1829); *History of the County of Middlesex* (1839); *History of Pittsfield* (1844); and *Genealogy of the Brainerd Family* (1857). He received the degree D.D. from Williams College 1837.

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FIELD, DAVID DUDLEY, LL.D.: 1805, Feb. 13—1894, Apr. 13; lawyer; b. Haddam, Conn., son of David Dudley F. (q.v.). He graduated at Williams College 1825, studied law in Albany and New York, was admitted to the bar 1828, and practiced continuously in New York till 1885. From an early period in his professional career he labored to secure a reform in the practice of law. In 1839 his first efforts resulted in a *Letter on the Reform of the Judiciary System*, the substance of which he presented in an address to a legislative committee that had been appointed through his influence. He prepared and gained the introduction of three bills on the subject 1841, but no decisive action was taken on them. Five years later he published in pamphlet *The Reorganization of the Judiciary*, and the constitutional convention of 1846 recommended a general code such as he suggested. His next step was the publication of *What Shall be Done with the Practice of the Courts? Shall it be wholly Reformed? Questions addressed to Lawyers* (1847), and soon after its appearance he was appointed a commissioner to reform the practice in the state. At the end of two years he reported two codes of procedure, one civil, the other criminal. The former was almost wholly adopted by the state and has since been adopted by 23 states and territories. In 1857 he was appointed chairman of a commission to codify the whole body of the law, and 1865 reported a political code, penal code, and civil code. Nearly 25 years were spent in the preparation of these 5 codes. Later he headed an organization for the reform and codification of the law of nations, looking to arbitration for the settlement of international disputes. He filled an unexpired term in congress 1876, was one of counsel for the democratic party before the electoral commission 1876-7, and in later years acted with that party.

FIELD, EUGENE: journalist and poet: 1850, Sep. 2—1894, Nov. 4; b. St. Louis, Mo.; son of Roswell Martin F., first attorney for Dred Scott. He entered Williams Coll. 1868, Knox Coll. 1869, and the Univ. of Missouri 1871, leaving the latter at the beginning of his senior year, when he travelled abroad, having inherited about \$70,000. On his return he entered the field of journalism, first in St. Louis, Mo., then in Chicago, where he remained till he died. His place was in the front rank of journalistic humorists, though he attained fame as a writer of loving and pathetic verses concerning children. His love for children was the inspiration of his best poetry. He published a number of books, prose and poetry, the latter being lyrical.

FIELD, HENRY MARTYN, D.D.: Presb. clergyman: b. Stockbridge, Mass., 1822, Apr. 3; son of David Dudley F. D.D., Congl. pastor in that town. He graduated at Williams College 1838, studied theol. in E. Windsor Seminary and at Yale Divinity School, and was installed pastor of a Presb. church in St. Louis, Mo., 1842. He remained there five years, then spent three years in European travel, was a witness of the revolution in France and Italy 1848,

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and returning to the United States held a Congl. pastorate in West Springfield, Mass., 1851-54. In the latter year he removed to New York and became editor of the *Evangelist*, of which he subsequently became sole proprietor. He made a tour of Europe 1858, a journey around the world 1876-7, and a visit to the Holy Land, 1882. His published works include *The Good and the Bad in the Roman Catholic Church* (1848); *The Irish Confederates and the Rebellion of 1798* (1851); *Summer Pictures: From Copenhagen to Venice* (1859); *History of the Atlantic Telegraph* (1866); *From the Lakes of Killarney to the Golden Horn*, 2 vols. (1876); *From Egypt to Japan* (1877); *On the Desert* (1883); *Among the Holy Hills* (1884); *The Greek Islands and Turkey after the War* (1885); and *Gibraltar* (1888). He is a most charming and instructive writer of travels, and his successive volumes have been received with wide popular favor.

FIELD, KATE: author: 1840-96, May 19; b. St. Louis, Mo.: daughter of Joseph M. F. She received a seminary education in Mass., and studied music in Europe, spent several years in foreign travel, and while abroad corresponded with the *New York Tribune*, *Philadelphia Press*, *Chicago Tribune*, *Boston Courier and Transcript*, *New Orleans Picayune*, and *Springfield Republican*, and wrote numerous magazine articles and reviews of foreign subjects. In 1874 she made her first appearance as an actress as *Peg Woffington* in Booth's theatre, New York, and 1882-3 was pres. of a ladies' cooperative assoc. in New York. She was a skillful dramatic critic, and she attained popularity as a lecturer. Miss F. published *Planchette's Diary* (1868); *Adelaide Ristori* (1868); *Mad on Purpose*, comedy (1868); *Pen Photographs from Charles Dickens's Readings* (1868); *Hazard* (1873); *Ten Days in Spain* (1875); and *History of Bell's Telephone* (1878). In 1890 she started a personal journal, *Kate Field's Washington*, which was discontinued 1895.

FIELD, STEPHEN JOHNSON, LL.D.: assoc. justice U. S. supreme court: b. Haddam, Conn., 1816, Nov. 4; son of David Dudley F., D.D., Congl. pastor in that town. When 10 years old he accompanied a married sister to Smyrna to study oriental languages, graduated at Williams College, 1837, studied law with his brother David Dudley F. in New York, became his partner after being admitted to the bar, spent the year 1848 in European travel, and removed to Cal. 1849. Shortly after reaching San Francisco he became a founder of Marysville, was elected its first alcade, 1850, Jan., and a member of the legislature in Oct. following, serving on the judiciary committee and taking a conspicuous part in the task of regulating the civil and criminal procedure of the courts of the state. In 1857 he was elected a judge of the supreme court of Cal. for six years, but before the time for entering upon his duty was appointed to fill a sudden vacancy on the bench of that court, and became chief justice on the resignation of David S. Terry, 1859, Sep. He held this office till 1863, when he was appointed by Pres. Lincoln an assoc. justice of the

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U. S. supreme court, which office he still (1888) holds. In 1869 he was appointed prof. of law in the Univ. of Cal., 1873 member of a commission to prepare amendments to the codes of the state for legislative action, 1877 became a member of the electoral commission (q.v.) and voted with the minority in favor of the democratic claim, and 1880 was a candidate before the national democratic convention for the presidential nomination. He is a man of deep scholarship and great independence of character, and during the exciting days of the early statehood of Cal. rendered many decisions at personal peril. In a number of instances like the Puebla case (1864), the test-oath and 'iron clad' oath cases, and the legal-tender, New Orleans slaughter-house, confiscation, and Chinese queue cases, his decisions have rendered him locally unpopular and elicited wide comment. But in all, his personal courage, profound legal erudition, and judicial integrity have never been questioned by right-minded and orderly citizens. Judge F. received the degree LL.D. from Williams College 1864.

FIELDFARE, n. *fēld'fār* [AS. *fealo-for*—from *fealo*, yellowish; *faran*, to go or wander], (*Turdus pilaris*): species of Thrush (q.v.), in size about equal to the blackbird, but, with greater length of wing; general color gray, feathers tipped with a brownish black elongated spot; throat and breast reddish yellow, streaked and spotted with black; forepart of the back and wings of rich brown color; tail slightly forked and nearly black; under parts white. The F. is a very common winter visitant of Britain, though it rarely breeds even in the n. parts of the island. It arrives



Fieldfare (*Turdus pilaris*).

from more northern regions when the winter has fully come, and departs toward the end of spring. It is well known to youthful sportsmen, and affords much employment for their guns during the Christmas holidays, when it may generally be found in small flocks—often with its smaller congener the redwing—in fields, if the weather is mild, feeding on worms, snails, etc., or, in severe weather,

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about hedges, thickets, and woods, wherever haws and other such fruits or seeds are abundant. Its winter migrations extend south as far at least as the islands of the Mediterranean. It is one of the summer songsters of the n. of Europe and of Siberia; its song is soft and melodious, but is less often heard than its call-note, which is harsh. It is extremely plentiful in Norway, where its nests are generally built in spruce firs, and, contrary to the ordinary habits of thrushes, in society; numerous nests being often in the same tree, and '200 nests or more being frequently seen within a very small space.' The F. is easily tamed, and sings well in captivity.

FIELDING, *feld'ing*, COPLEY VANDYKE: abt 1787-1855, Mar. 3; English painter in water-colors. He began to exhibit 1810. For many years he held the office of Pres. of the Soc. of Painters in Water-colors, and was generally recognized as the representative of that branch of art in England. He died at Worthing, in Sussex, after a career of steady prosperity. Possessing remarkable mechanical dexterity and knowledge of effect, F. painted with what severe critics would call fatal facility. He contributed about a score of pictures annually to the exhibition of the Water-color Society. Yet, he always exhibited a certain easy finish of treatment, perhaps of itself a kind of secondary talent. Although his range of subjects was but limited, yet within it he was almost unrivalled. As a painter of marine effects, and of the landscapes of down and glade, it is thought by many that he has had as yet no equal.

FIELDING, HENRY: 1707, Apr. 22-1754, Oct. 8; son of Gen. Edmund F., connected with the Earls of Denbigh. He was sent to Eton, and then to the Univ. of Leyden, for legal study. Returning to London, he began to write for the stage, and between 1727-36 produced nearly a score of comedies and farces, which were forgotten with nearly as much speed as they were produced. He married 1736, and falling heir to a small estate, he, with his young wife, retired from London. But his was not a Fortunatus's purse, and his hand was continually in it; and in three years after his marriage, he was back in London a student at the Temple. He was called to the bar at the usual time, but gout intervening, steady practice was rendered impossible. Happily, a way of escape was at hand. Richardson published *Pamela*; the town was ringing with it; and F., whose strong, healthy, unconventional nature revolted from the moral priggishness of 'Virtue Rewarded,' resolved to write a counterpart, purporting to be the adventures of Pamela's brother, *Joseph Andrews*. This work, begun in a satirical mood, and intended merely to quiz Richardson, deepened as it proceeded and flowered out into humorous adventure. The exquisite character of Parson Adams took the world by surprise, and remains one of the permanent treasures of English fiction. The next important work undertaken by F. was *Jonathan Wild*, a master-piece of irony, which has never been sufficiently appreciated, and which doubtless suggested to Mr. Thackeray the scope

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and conduct of *Barry Lyndon*. The rebellion of 1745 induced F. to undertake the direction of the *Jacobite Journal*, in support of the Hanoverian succession; and shortly afterward as a reward for his loyalty, he was, through the influence of Lord Lyttelton, promoted to a pension, and to the place of justice of the peace of Middlesex and Westminster. While engaged in magisterial duties, he produced *Tom Jones*, his most famous fiction, which the world has not ceased to read, nor critics to admire. His next work was *Amelia*—less striking and masterly than its predecessor, but quieter in style, and enriched with scenes of domestic tenderness. Shortly after its publication, he was attacked by dropsy, jaundice, and asthma. Seeking relief, he went to Lisbon, but after a few months' residence died there. See the life prefixed to Leslie Stephen's edition of F. (10 vols. 1882), and the short work on F. by Austin Dobson (1883).

F. was the first great English novelist, and he remains to this day one of the greatest. *Tom Jones* is a miracle of invention, character, and wit. It contains the most amusing scenes and adventures, the most sparkling delineations of life, high and low, the most abundant satire. Everywhere, the author's manliness, shrewd sense, and scorn of meanness and hypocrisy, are apparent. On the other hand, it must be said that F.'s nature was more robust than delicate; that it was deficient in the sentimental and poetic side; and as a consequence, that his ideal of woman is not high, and his descriptions of the tender passion either commonplace or extravagantly rapturous. The love-scenes between Tom and Sophia, and the episode of the 'Man of the Hill,' meant to be passionate and poetic, are the portions of the great novel which readers skip. It is to be regretted that all F.'s works are disfigured by coarseness of circumstance and expression; but that was the fault of the time as much as of the man. He was coarse, for the same reason that he wore ruffles, drank claret, and hated the Pretender. He set himself to paint society as he saw it, and painted it truthfully.

FIELD OF THE CLOTH OF GOLD: historical name of the place between Ardres and Guisnes, where the French King Francis, entertained the English King Henry VIII. with unprecedented magnificence, 1580, June 4-24. Francis was anxious to gain the support of Henry and Cardinal Wolsey in his impending conflict with Charles V. of Germany, who had been elected Emperor of Spain also the previous year. Charles had previously sought the friendship of Henry and his famous cardinal, and had made a virtual promise of the papacy to the latter. Francis, enraged at Charles's election to the throne that he himself coveted, subsequently made the same promise to Wolsey, who is credited with arranging the meeting of the French and English courts on French soil. All manner of feats of chivalry, gallant exercises, dancing, dramatic representations, and even a wrestling match between the sovereigns, were provided. Though Francis's hospitality was boundless, he failed in his object. Henry, who held the balance

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in his hand, returned Charles's visit after his entertainment by Francis, and declared his desire to remain impartial but that he should pronounce against the aggressor. Francis began hostilities and in the midst of disasters, 1522, May 29, received a declaration of war from Henry. See Shakespeare's *Henry VIII.*, Act 1, Scene 1.

FIELDS, *fēldz*, JAMES THOMAS, LL.D.: 1717, Dec. 31—1881, Apr. 24; b. Portsmouth, N. H.: author and publisher. He received a public school education, became a clerk in a bookstore in Boston when 17 years old, read the anniversary poem before the Mercantile Library Assoc., the following year, helped establish the publishing firm of Ticknor, Reed & F., soon after attaining his majority, and continued a member of it through several changes of name till 1870. He edited the *Atlantic Monthly* 1862–1870, collected and issued De Quincey's writings in 21 vols., lectured frequently before the Dartmouth and Harvard college societies, and after retiring from the firm made a number of lecturing tours through the United States. He was author of editions of *Poems* (1849, 54, 58); *Yesterdays with Authors* (1872); *Hawthorne* (1876); and *In and Out of Doors with Charles Dickens* (1876); and with Edwin D. Whipple edited the *Family Library of English Poetry* (1877). He received the decree LL.D. from Dartmouth College 1867.

FIEND, *n.* *fēnd* [Goth. *fjands*; Ger. *feind*, an enemy—from Icel. *fjá*; Goth. *fjan*, to hate: Icel. *fjandi*, a hater, an enemy]: an infernal enemy; an implacable or malicious foe; the devil. FIEND'ISH, *a.* like a fiend; also FIEND-LIKE, *a.* FIEND'ISHLY, *ad.* -*li*. FIEND'ISHNESS, *n.* the quality of a fiend; intense maliciousness.

FIERAMENTE, *adv.* *fē-är-a-mēn'tā* [It.]: in *mus.*, proudly; fiercely; boldly.

FIERCE, *a.* *fērs* [F. *feroce*; OF. *fers*, fierce—from L. *fērōcēm*, fierce—from *fērus*, wild]: savage; furious; very violent or passionate; very eager; outrageous. FIERCE'LY, *ad.* -*li*. FIERCE'NESS, *n.* ferocity; fury; violence.—SYN. of 'fierce': barbarous; fell; ferocious; wild; violent; impetuous; unrestrained; ardent; vehement.

FIERDING COURT, *fērd'ing kōrt*, (Fierding Thing): district court in use among the early Gothic nations. This court was established, to render speedy justice in small matters. There were four of these courts in every hundred, each presided over by a separate judge, whose jurisdiction extended to all causes where the matter in dispute did not exceed the sum of three marks, Stiernhook, *De Jure Goth.*, lib. 1. c. 2.

FIERI FACIAS, *n.* *fī'ēr-ī-fā'shī-ās* [L. *fieri*, to be made; *faciās*, you may make, you cause]: the first conspicuous words of a writ in Latin authorizing certain legal steps to be taken to recover a debt or damages allowed by the court. WRIT OF FIERI FACIAS, writ for enforcing the judgment of a court of law against the goods of a debtor. It may be sued out as soon as final judgment has been signed, or, in case of a trial out of term, in 14 days after verdict, unless, on special cause shown, a judge order speedy execution.

FIERY—FIESCHI.

But a writ of fieri facias cannot be enforced after a *Capius ad satisfaciendum* (q.v.) has been issued. The sheriff, in executing this writ, may not break open outer doors; but having obtained peaceable entrance, he may break open inner doors, cupboards, and trunks. The officer in execution having taken possession, may leave an assistant in charge, by whom an inventory of the goods is made. He is entitled to remain on the premises a reasonable time, in order to remove the goods; but if he continue longer without permission of the owner, he is liable to an action for trespass. The goods of the party only who is named in the writ may be seized (certain needful articles to a small amount being exempt from seizure); and if the officer take goods belonging to a stranger, he is liable to an action for damages. For the corresponding process in Scotland, see **POINDING**. *Fieri facias de bonis ecclesiasticis* in Eng. law, is a writ directed to the bishop of the diocese, requiring him to attach the ecclesiastical goods of a clergyman within his diocese, in satisfaction of the judgment of a court of law.

FIERY, a. *fīr'ī* [from *fire*, which see]· passionate; irritable; easily provoked; like fire; bright; impetuous. **FIERYNESS**, n. *-ī-nēs*, hot qualities; heat of temper. **FIERYLY**, ad. *-ī-lī*. **FIERY CHAMBER**. see **CHAMBRE ARDENTE**.—**SYN.** of 'fiery': burning; ardent; hot; scorching; vehement; impetuous; fierce; unrestrained; heated.

FIESCHI, *fē-ēs'kō*, GIOVANNI LUIGI, Count: abt. 1523-1547, Jan. 2: member of one of the most illustrious houses of Genoa. His name has a tragic celebrity in connection with a conspiracy of which he was the chief. Andrea Doria, a famous admiral, sprung from a race hereditarily at feud with that of F., having expelled the forces of Francis I. from the state, had restored the republican government, but at the same time, by his vigorous administration, effectually held in check the ambition of the nobles. Count F. organized a plot, having for its object the death of Doria, and his nephew Gianettino, whom specially F. hated, and the establishment of an oligarchic government. Instigated by the approval of France and Rome, and supported by an alliance with the Duke of Parma, F. speedily enrolled a formidable array of accomplices, his three brothers among the foremost. Crowds of his own feudal retainers were secretly armed and assembled from the various hereditary lands of the house; three galleys, purchased with the connivance of the pope, were fully equipped, and all being in readiness, the attempt was fixed for 1547, Jan. 2. Doria, in spite of repeated warnings, refused to ascribe treacherous or subversive designs to F., whom he regarded as a fast friend and partisan. Complete success seemed at first to be with the conspirators; the gates of the city were forced, the fleet captured, Gianettino assassinated, Doria in flight. F. had but to appear and dictate, but he was nowhere to be found: in stepping from one galley to the other in the darkness of night, F. had stumbled, and falling overboard, was borne down by his ponderous armor, and miserably

FIESCHI—FIESOLE.

drowned in the harbor, or, according to some, stifled in the slime.

FIES'CHI, JOSEPH MARCO: 1790-1836, Feb. 16; b. Corsica: conspirator and assassin, on the life of King Louis Philippe. A profligate career appears to have reduced him to great poverty about 1835, when he conceived the diabolical design of assassinating King Louis Philippe—the immediate cause being the suppression of a situation which he held, by order of the Prefect of the Seine. Disguising his crime under the cloak of political enthusiasm, he leagued with himself two or three obscure persons, of pothouse politics, who hated the government of the Citizen King. F. planned and caused to be made an infernal machine with 20 barrels, that could be simultaneously discharged. On the approach of the king and queen, at the review of the National Guards, in the Boulevard du Temple, 1835, July 28, he fired his machine, and killed 18 people, among whom was Marshal Mortier, who fell dead beside his sovereign. The king escaped with a mere scratch, and continued the review. F. was immediately seized, and with his three accomplices, was tried, condemned, and put to death.

FIESOLE, *fyā'zo-lū* or *fe-ēs'o-lū* (anciently, *Fæsulæ*): one of the most ancient Etruscan cities; on the crest of a hill, about three m. from Florence, of which it may be said to be the parent city. From the heights of F., the view presented by Florence and the neighboring valleys is gorgeous in the extreme. We find F. first mentioned B.C. 225, during the great Gaulish war. Hannibal encamped here after crossing the Apennines. The city was destroyed by Sulla in the Social War (B.C. 90-89), and he afterward dispatched thither a military colony. At the invasion of Tuscany by the Goths, F. also fell under their dominion, and being by nature and art a formidable stronghold, was numerously garrisoned by the barbarians. The growth of Florence during the middle ages gradually reduced it to insignificance. The only vestige of Etruscan structures still remaining is the cyclopean city wall, of huge blocks of stone, many portions of which are wonderfully perfect. The site of the Etruscan fortress is now occupied by a convent, and interesting fragments of the foundations are often brought to light. The amphitheatre and other remains belong to the Roman age. The very ancient church of St. Alexander, supposed to have been originally a pagan temple, contains an altar dedicated to Bacchus, the inscription of which is, however, illegible, owing to a fissure in the middle. Coins and other relics have been repeatedly dug up. Pop. abt. 2,500.

FIE'SOLE, FRA GIOVANNI DA (known also as *Il beato Angelico*): one of the regenerators of Italian art: 1387-1455; b. Mugello. In 1407 he entered the Dominican order, and, with his brother, consecrated his artistic abilities exclusively to sacred aims, illustrating various works of devotion with beautiful miniature designs. These early artistic efforts are remarkable for rich effects of coloring, gorgeous illumination, and exquisite elaboration of the most

FIFE--FIFESHIRE.

minute ornamental details. Having achieved high reputation as frescoe painter by some noble compositions with which he endowed his own and other convents, he was commissioned by Cosmo de' Medici, with the decoration of the church of Santa Annunziata and the convent San Marco. Each cell of the convent was adorned with a fine fresco of large dimensions, and amid other painting; can still be distinguished F.'s 'Annunciation.' The fame of this work induced Pope Nicholas V to summon him to Rome, and intrust him with the execution of a series of illustrations taken from the life of St. Laurence, destined to embellish the private chapel of St. Laurence in the Vatican. See Giangiacomo Romano, *Le Pitture della Cappella di Nicolò V.* etc. (Rome 1810). So rigid a disciplinarian was F., that no private or public work was ever undertaken without the formal consent of his superiors being obtained, and to them all pecuniary remuneration was transferred. The archbishopric of Florence, spontaneously offered him by the pope was humbly declined. He died in Rome. The gallery of Florence possesses several pictures of F., still undimmed in brilliancy of coloring. One of these, the *Birth of John the Baptist*, is a conception full of simple and winning grace. Some of the largest easel-compositions of this artist at present adorn the gallery of the Louvre; among those in the antechamber are the *Coronation of the Virgin*, and the *Miracles of St. Dominico*. One supreme aim pervades all the creations of F.—that of arousing lofty devotional feeling through the contemplation of the beautiful in art.

FIFE, n. *fif* [Ger. *pfeife*; It. *piffaro*, F. *fifre*, a fife; imitative of a shrill note]: a small flute with one key; a kind of pipe. V. to play on the fife. FIFING, imp. FIFED, pp. *fift*. FIFER, n. one who.—The *Fife* is an ancient wind-instrument of military music, in which the melody is produced by blowing through a hole in a reed or tube, while the escape of air is regulated by the fingers stopping or opening a number of other holes in different parts of the pipe. It has a compass of two octaves, from D on the fourth line of the treble clef to D above in altissimo. The fife figures in the sculptured memorials of the Argonautic expedition, and from that time to this has maintained its place as a simple yet effective instrument for martial purposes. It was common with English troops till the reign of James I., but was then discontinued; to be re-introduced by the Duke of Cumberland at the siege of Maestricht 1747. It is a universal favorite in the navy. Drums and fifes supply a simple but stirring music.

FIFE-NESS. *fif-nēs*: promontory of Scotland, eastmost point of Fifeshire; lat. 56° 17' n., and long. 2° 35' w. A mile n.n.e., in the sea, is the dangerous Carr Reef, where a lightship was moored 1886. F.-N. is in view of the Isle of May and Bell Rock lights. In the Ness, trap rocks jut through the carboniferous strata, and the rocks contain small caves.

FIFESHIRE, *fif-shēr*: maritime, almost peninsular

FIFTEEN—FIFTH MONARCHY MEN.

county of the e. of Scotland, between the Firth of Forth on the south and the Firth of Tay on the north. It is 41½ m. in extreme length from n.e. to s.w., and 21 at its greatest breadth, 513 sq. m.; coast-line, 100 m., mostly rocky, and having many small ports. The surface is a succession or cultivated vales and hills. The hills rise in the West Lomond, 1713 ft., and Largo Law, 965. The chief rivers are the Tay, Forth, Eden (30 m. long), and Leven (16 m.). F. rests on old red sandstone, with trap rocks in the north, and carboniferous strata, with trap, in the south. There are many coal and iron mines, and lime quarries. The climate is dry, healthful, and mild on the Forth; but the valleys in the n. are much exposed to the full sweep of e. and n.e. gales. The soil is a rich loam, or wet clay on till. The Howe of Fife, on the Eden, is mostly sandy and gravelly, and not very productive. In 1880 the total acreage under all kinds of crops, bare fallow, and grass, was 246,480 acres; under corn crops, 86,584; under green crops, 47,179; clover, sanfoin, and grasses under rotation, 62,033. The total number of cattle reported the same year was 39,674; sheep, 72,873; pigs, 5,229; horses used for agriculture, etc., 10,202. F. has a greater number of proprietors, gentlemen's seats, and plantations, in proportion to its size, than any other Scotch county, and its coasts are thickly studded with towns and villages. The chief manufactures are linen, floor-cloth, and malt liquors. F. has 61 parishes. Pop. (1881) 171,960; (1891) 187,320. It returns one member to parliament. The chief towns are Cupar (county town), Dunfermline, St. Andrews, Kirkcaldy, East and West Anstruther, Burntisland, Crail, and Dysart. The ancient 'Kingdom of Fife' was the most cultivated, as well as the most warlike, of Scotch counties. It contains striking monastic, feudal, and palatial ruins of St. Andrews, Dunfermline, Falkland, and Lindores; many Celtic and Roman remains. Many of the events connected with the Scottish Reformation took place in this county, especially at St. Andrews.

FIFTEEN, a. *fif'tēn* [*five* and *ten* (see **FIVE**): *five* and *ten*. **FIFTEENTH**, a. *-tēnth*, the fifth after the tenth; ordinal of 15; in *organs*, a stop tuned two octaves above the diapasons, its lowest C pipe being 2 ft. long. **FIFTH**, a. *fifth*, ordinal of 5; next after the fourth: N. one of five equal parts; in *music*, an interval of three tones and a semitone. **FIFTHLY**, ad. *-lī*, in the fifth place. **FIFTY**, a. *fif'tī*, five times ten. **FIFTIETH**, a. *-ēth*, ordinal of 50. **FIFTH-WHEEL**, a wheel or segment above the fore axle of a carriage and beneath the bed.

FIFTH MON'ARCHY MEN: religious sect in England, holding to one strange form of opinion which the religious and political fermentation of the 17th c. brought to the surface of society, and embodied in sects. The date which has been assigned to their first appearance is 1654. Notwithstanding the ridicule with which they have often been overwhelmed, there seems nothing in their tenets more objectionable than in those of many other sects of the

FIFTH MONARCHY MEN.

period; and there is no reason to believe that the practices of their leaders exceeded in absurdity, or equalled in impiety, those of Robbins, Reeve, Muggleton, and other apostles of the Ranters. In common with most persons who hold the literal rather than the spiritual interpretation of prophecy, they believed in the four great monarchies of Antichrist marked out by the prophet Daniel; and quite consistently with Christian orthodoxy, they added to them a *fifth*—viz., the kingdom of Christ on earth. So far, there was nothing peculiar in their views. But their error was twofold. 1st. They believed in the immediate, or at least in the proximate, advent of Christ (a tenet common to them with the early church); and 2d. They held that the fulfillment of God's promise to this effect must be realized by the forcible destruction of the kingdom of Antichrist. Every obstacle which opposed itself to the setting up the Messiah's throne was to be thrown down, and what these obstacles were was a question for the solution of which the only criterion which presented itself was their own fanatical prejudices. It is obvious that such doctrines in such times must have given rise to practical as well as speculative disorder. The sect, never very numerous, became extinct shortly after the Restoration; a fact which, by depriving them of exponents of their own body, has probably exposed them to misrepresentation (Marsden's *History of the later Puritans*, p. 387). In politics, the Fifth Monarchy Men were republicans of the extremest section; and when their conspiracy to murder the Protector, Cromwell, and revolutionize the government, was discovered 1657, their leaders, Venner, Grey, Hopkins, etc., were imprisoned in the Gate House till after the Protector's death. Among their arms and ammunition which was seized, was found a standard exhibiting a lion couchant, supposed to represent the lion of the tribe of Judah, with the motto 'Who will rouse him up?'—Neal's *Puritans*, IV. 186. See also Carlyle's *Cromwell's Letters and Speeches*, III. 31.

FIG.

FIG, n. *fig* [F. *figue*—from L. *ficūs*, a fig: AS. *fic*; Ger. *feige*; It. *fico*, a fig]: a well-known fruit of a pear-like shape; the tree *Ficus Cāricā* (see below): something of little value or worthless; a snap of the fingers with the arm upraised as a mark of contempt: V. to give a snap of the fingers to or toward. FIG'GING, imp. FIGGED, pp. *figd*. FIG-EATER, same as BECOFICO (q.v.). FIG-MARIGOLD, in *bot.*, common name for the species of the genus *Mesembryanthemum*, belonging to the family *Ficoideæ*. FIG-PECKER, same as FIG-EATER. FIG-SHELL, in *conch.*, a popular name for *Pyrula*, genus of sub-tropical shells, which have a fig- or pear-shaped form with a short spire. They have a wide, sub-tropical range. Forty species have been described, living at a depth of 17 to 35 fathoms. FULL FIG, in *familiar language*, in full dress. A FIG FOR YOU, care nothing for you; condemn and despise you: see FICO. FIG. contr. for FIGURE.

FIG (*Ficus*): genus of trees and shrubs belonging to the nat. ord. *Moraceæ*, and distinguished by having the flowers—male and female mixed—within an almost closed top-shaped, fleshy, receptacle, which enlarges to form the fruit, and incloses numerous one-seeded carpels, imbedded in its pulp. There are more than 100 species, some of them very large trees. Almost all belong to tropical and sub-tropical countries, of the vegetation of which they often form an important feature. They abound in India, in every jungle and hilly situation, to the most northern Himalaya, and some of them are cultivated about every village. Both *F. religiosa* (the Peepul) and *F. Rumphii* are held in veneration by the Hindus. The most notable species are the Common Fig (see below); the Banyan (q.v.); the Peepul (q.v.), Bo Tree, or Sacred Fig of India; the Sycamore (q.v.); and the East Indian Caoutchouc (q.v.) Tree. The leaves of some species are entire, those of others lobed. Several species of fig show the character for which the banyan in particular has become celebrated, of sending roots straight down to the ground from their spreading branches, and thus multiplying the apparent stems, by which a vast canopy of branches and foliage is supported. The E. Indian Caoutchouc or India-rubber Tree is remarkable for the exposure of its roots, which appear in masses above ground, extending on all sides from the base like great writhing snakes. Some figs are creeping or trailing shrubs, with slender stems, covering heaps of stones, or ascending trees like ivy.—Besides the Common Fig, many species yield edible fruits, though none of them are nearly equal to it in value. Among them are the Peepul (*F. religiosa*), *F. Benjamina*, *F. pumila*, *F. auriculata*, *F. Rumphii*, *F. Bengalis*, *F. aspera*, *F. racemosa*, and *F. granatum*, all E. Indian, also the Sycamore of Egypt.—The milky juice of some species is bland and abundant, as of *F. Saussureana*, which has therefore been ranked among Cow-trees. In other species, the milky juice is very acrid. That of the Common Fig produces a burning sensation on the tongue. That of *F. toxicaria*, native of the Malayan islands, is used for poisoning arrows.—LAC (q.v.) is gathered from some species.

FIG.

—The leaves of *F. politoria* are so rough that they are used for polishing wood and ivory in India. The juice of the fruit of *F. tinctoria* is used in Tahiti to dye cloth: the color is at first green, but being acted on by the juice of a *Cordia*, it becomes bright red. The bark supplies cordage, of which fishing-nets are made.

The COMMON FIG (*Ficus Carica*) is a native of the East, as the specific name *Carica* (from *Caria*) imports; but it is now cultivated throughout the south of Europe, and is even found naturalized there. Its cultivation has extended also to many warm countries. In the United States, it is seldom seen further n. than Philadelphia; and it is not sufficiently



Common Fig (*Ficus Carica*):

a, male flower, magnified; b, male flower, natural size; c, female flower, magnified; d, female flower, natural size.

hardy to be common in Britain, though even in Scotland figs may occasionally be seen ripened on a wall; and in the south of England fig-trees are sometimes grown as standards, and a few small fig orchards exist. Protection is always given in some way during winter. Near Paris, and in some other parts of the continent of Europe, fig-trees are so trained that the branches can be tied in bundles and laid along the ground, when they are covered with litter and earth. The fig is a low deciduous tree or shrub, with large deeply lobed leaves, which are rough above, and downy beneath. The branches are clothed with short hairs, and the bark is greenish. The fruit is produced singly in the axils of the leaves, is pear shaped, and has a very short stalk; the color in some varieties is bluish-black; in others, red, purple, yellow, green, or white. The varieties in cultivation are numerous. In warm climates, the fig yields two crops in the year—one from the older wood (midsum-

FIGARO—FIGHTING FISH.

mer shoots of the preceding year), and a second from the young wood (spring shoots of the same year); but in colder regions the latter never comes to perfection. Fig-trees are propagated by seed, by suckers, etc.; very frequently by layers or by cuttings. Dried figs are an important article of food in the Levant; in more northern regions, they are used for dessert, or for medicinal purposes, being applied to gumboils and other sores, and also administered in pulmonary and nephritic affections, and to relieve habitual constipation. The pulp contains about 62 per cent. of a kind of sugar called *Sugar of Figs*. Figs are dried either in the sun or in ovens built for the purpose. Great quantities are annually exported from the Mediterranean. The best are mostly from Smyrna, and are known as *Turkey figs*, of which those called *Eleme* or *Elemi* are most highly esteemed. Figs of inferior quality are exported in considerable quantities in the form of *fig-cake*, pressed with almonds into cakes somewhat like small cheeses. In the Levant, Portugal, and the Canaries, a spirit is distilled from fermented figs.

FIGARO, n. *fě'gǎ-rō'*: dramatic character introduced on the Parisian stage 1785 by Beaumarchais (q.v.) in his *Barbier de Seville* and *Mariage de Figaro*. These plays, in which F., who coolly outwits every one, is first a barber and then a valet-de-chambre, secured for their author a brilliant reputation not only in France, but also in Germany, where many translations and adaptations of the pieces appeared. Mozart, Paesello, and Rossini also made them the basis of classic operas. Since their publication, the character of F. has stood as a type of cunning, intrigue, and dexterity. After the restoration of the Bourbons, a French literary periodical, distinguished for satirical talent, assumed the name.

FIGEAC, *fě-zhák'*: town of France, dept. of Lot, in a valley surrounded by finely wooded hills on the right bank of the Sellé, 32 m. e.n.e. of Cahors. It is irregular, its streets are narrow, and badly planned, and its houses in general not well built; but the antiquity and quaintness of many of its buildings give it a picturesque and interesting appearance. It has two beautiful Gothic churches, one of them, that of St. Sauveur, has a choir of the 11th, a general superstructure of the 15th, and a modern front of the 19th c. F. owes its origin to a Benedictine monastery, founded by Pepin 755. It has some cotton manufactures, and a trade in wine and cattle. Pop. 5,600.

FIGHT, n. *fit* [AS. *feoht*: Ger. *fehchte*, a fight; Swiss, *fechten*; Dut. *vechten*, to struggle]: a battle; a combat: V. to contend for victory; to combat. FIGHTING, imp: N. contention; strife: ADJ. qualified for war; fit for battle. FOUGHT, pt. and pp. *faw'*, did fight. FIGHTER, n. one who.—SYN. of 'fight, n.': action; conflict; engagement; contest; struggle; fray; affray; encounter; duel; warfare.

FIGHTING FISH (*Macropodus pugnax* or *Ctenops pugnax*): small fresh-water fish, of the family *Anabasidae* (q.v.), native of the s.e. of Asia, particularly of Siam,

FIGLINE—FIGUIER.

where it is commonly kept as goldfishes are in western countries, but on account of its pugnacity, two of these creatures brought together, often rush immediately to combat, or it is even enough to introduce a looking-glass into the water, and the fish hastens to attack its own image. Fish-fights are a favorite amusement of the Siamese; the license to exhibit them yields considerable annual revenue; and an extraordinary amount of gambling takes place in connection with them; not merely money and property, but children and liberty being sometimes staked. The F. F. has the anal and dorsal fins prolonged into tapering points. When the fish is quiet, its colors are dull; but when it is excited, they glow with metallic splendor, and 'the projected gill-membrane, waving like a black frill around the throat, adds something of grotesqueness to the general appearance.'

FIGLINE, *fē-glē'nā*, or **FIGHINE**, *fē-ghē'nā*: town of central Italy, province of Florence, 15 m. s.e. from Florence, on the left bank of the Arno. It is surrounded by a rectangular wall, and is traversed by a fine street, through which passes the great road from Florence up the valley of the Arno. The silk of F. is the best in Tuscany. Pop. about 6,000.

FIGMENT, n. *fīg'mēnt* [L. *figmentum*, a figure, an image—from *finġo*, I form, I feign]: an invention; something feigned or imagined.

FIGO, n. *fī'gō*: for **FIG**, or **FICO**, which see.

FIGUEIRA, *fē-gā'ē-rā*: town of Portugal, province of Beira, at the mouth of the Mondego, 23 m. w. by s. from Coimbra. Its harbor is a small bay or estuary of the Mondego, and is safe, but difficult of access for large vessels. It carries, however, considerable trade. The chief exports are salt, wine, vinegar, oil, dried fruits, and oranges. The wine shipped from F. is known by the names of *Figueira* and *Bairrada Wine*. It is quite different both from port and from sherry. It is best when new, and does not bear keeping long. F. is much resorted to as a bathing-place. Pop. 6,000.

FIGUERAS, *fē-gā'rās*: town in the n.e. of Spain, near the French frontier, province of Gerona, in a fruitful district, 20 m. n.n.e. of the town of Gerona. Its streets are gloomy, but it has beautiful promenades. On a height near the town is the citadel of S. Fernando, strongest fortress of Spain, and the key of the Pyrenees on their s. side, with accommodation for 20,000 men. This fortress has been so frequently taken by the French, as to give rise to the saying among the Spaniards, that the citadel of S. Fernando, in time of peace, belongs to Spain, but in time of war to France. Pop. (1887) 11,912.

FIGUIER, *fe-gē-ā'*, **GUILLAUME LOUIS**: 1819, Feb. 15—1894, Nov. 9; French chemist and author; b. Montpellier. He received a scientific education, took his degree in medicine 1841, and removed to Paris 1842. In 1846 he was appointed prof. in the school of pharmacy at Montpellier, 1850 received the degree of physical sciences, and 1853 became

FIGULINE—FIGURATE NUMBERS.

a fellow of the school of pharmacy at Paris. He has contributed numerous articles to the *Annals of Science, Journal of Pharmacy, Scientific Review, The Press, and France*, and published a large number of works, among them, *Exposition et Histoire des Principales Decouvertes Scientifiques Modernes*, 3 vols. (1851–53); *Histoire du Merveilleux dans les Temps Modernes*, 4 vols. (1859–60); *Vie des Savants Illustres depuis l'Antiquité jusqu'au XIX^e Siècle* (1866); *Les Insectes* (1866); *Les Articulés* (1867); *Les Oiseaux* (1867); *Les Mammifères* (1868); *L'Homme primitif* (1869); *Les Races humaines* (1871); *Les Merveilles de l'Industrie* (1873–76); *Connaiss-toi toi-même*, elements of physiology (1878), and a drama, *Les Six parties du Monde* (1878).

FIG'ULINE: see POTTER'S CLAY.

FIGURANT, n. mas. and FIGURANTE, n. fem. *f'ig'û-rânt* [F. *figurant*, part. of *figurer*, to make a figure]: one of the dancers in a ballet; one who dances in groups or figures, not coming forward alone, but serving to fill up the scene and form a background for the solo performers.

FIGURATE NUMBERS: in Arithmetic, a class of numbers or series of numbers, whose nature will be understood from the following table:

	1,	2,	3,	4,	5,	6,	7,	etc.
I.	1,	3,	6,	10,	15,	21,	28,	etc.
II.	1,	4,	10,	20,	35,	56,	84,	etc.
III.	1,	5,	15,	35,	70,	126,	210,	etc.
			etc.				etc.	

The natural numbers are here taken as the basis, and the first order of figurate numbers is formed from the series by successive additions; thus, the 5th number of the first order is the sum of the first five natural numbers. The second order is then formed from the first in the same way; and so on.

If instead of the series of natural numbers, whose difference is 1, we take series whose differences are 2, 3, 4, etc., we may form as many different sets of figurate numbers. Thus:

	1,	3,	5,	7,	9,	etc.
I.	1,	4,	9,	16,	25,	etc.
II.	1,	5,	14,	30,	55,	etc.
III.	1,	6,	20,	50,	105,	etc.
			etc.		etc.	

Or—

	1,	4,	7,	10,	13,	etc.
I.	1,	5,	12,	22,	35,	etc.
II.	1,	6,	18,	40,	75,	etc.
III.	1,	7,	25,	65,	140,	etc.
			etc.		etc.	

The name *figurate* is derived from the fact that the simpler of them may be represented by arrangements of equally distant points, forming geometrical figures. The numbers belonging to the first orders received the general name of *polygonal*, and the special names of *triangular*, *square*, *pentagonal*, etc., according as the difference of the basis is

FIGURE—FIGWORD

1, 2, 3, etc. Those of the second orders are called *pyramidal* numbers, and according to the difference of the basis, are *triagonally*, *quadragonally*, or *pentagonally* pyramidal. The polygonal numbers may be represented by points on a surface; the pyramidal by piles of balls.

The general formula for polygonal numbers, from which any particular one may be found by substituting the proper values for n and r is,

$$\frac{(r-2)n^2 - (r-4)n}{2}$$

where n = number of the term required, r = the denomination (3 if *triagonal*, 5 if *pentagonal*, etc.).

FIGURE, *n. fig'ūr* or *fig'ēr* [*F. figure*—from *L. figurā*, shape, an image—from *figo*, I form: *It. figura*]: shape; form; appearance; a character or shape denoting a number; a mode of expression; a type; an emblem; a diagram; the steps or movements in a dance; in *art*, a representation of the human body; in *rhet.*, mode of speaking in which words are turned from their ordinary sense—usually termed figure of speech; in *logic*, the arrangement of the middle term of a syllogism with the two terms of the conclusion; in *familiar language*, price or value: *V.* to shape or form; to represent; to make a figure. **FIG'URING**, *imp.* **FIG'URED**, *pp. -ērd*: **ADJ.** adorned with figures or ornaments. **FIGURED BASS**, in *music*, a bass part with figures placed over the notes, which indicate the harmony to be played to each note, and serve as a guide to the accompanist, invented in the 17th c. by Ludovico Viadana. **FIGURED-COUNTERPOINT**, in *music*, several notes of various lengths, with syncopations and other ornamental lengths set against the single notes of the canto fermo. **FIGURED-MELODY**, in *music*, the breaking up of the long notes of the church melodies into larger or more rapid figures or passages. **FIG'URABLE**, *a. -ū-rā-bl*, capable of being brought into a fixed shape. **FIG'URABILITY**, *n. -bīl'ī-tī*. **FIG'URAL**, *a. -rāl*, pertaining to figures. **FIGURATE**, *a. fig'-ū-rāt*, of a certain and determinate form. **FIGURATE NUMBERS** (see below). **FIG'URATELY**, *ad. -lī*. **FIG'URATIVE**, *a. -rā-tiv*, not real; representing something else; typical; abounding in figures or metaphors. **FIG'URATIVELY**, *ad. -lī*, in a sense different from the usual sense. **FIG'URATIVENESS**, *n.* **GRAMMATICAL FIGURE**: see **METONYMY**: **SYNECDOCHE**. **RHECTORICAL FIGURE**: see **METAPHOR**. **FIGUREHEAD**, a carved ornament in human or other form at the prow or fore-part of a ship. **FIGURE-STONE**, a variety of talc or soapstone (see **SOAPSTONE**). **TO CUT A FIGURE**, to make a show; to attract attention.—**SYN.** of 'figure, *n.*': outline; structure; conformation; configuration; image; mold; fashion; metaphor; simile; similitude; representation; statue; drawing; pattern; design; conduct; career; a number; a digit; value; price; representative; a trope.

FIGWORT, *n. fig'wört* [*fig* and *wort*]: a wild roadside plant with small flowers; indigenous to N. America and Europe: the knotted figwort, formerly deemed a remedy for scrofula, is *Scrophularia nodosa*, ord. *Scrophulariæcæ*.

FIJI ISLANDS.

FIJI, *fē'je* (or **FEEJEE**, or **VITI**, *vē'tē*) **ISLANDS**: archipelago of about 250 islands in the Pacific Ocean; lat. $15^{\circ} 30' - 20^{\circ} 30'$ s., long. 177° e.-- 178° w.; total area 8,034 sq. m., almost equal to the area of Mass.: since 1874 a dependency of the British empire. The group was discovered 1646 by the Dutch navigator Tasman. The largest of the group, Viti-levu, or Big Viti, has 4,479 sq. m.; Vanua-levu, 2,486 sq. m.; and all the other islands together, have 1,069 sq. m. The islands are of volcanic origin, and though there are no longer any active volcanoes, yet hot springs, numerous earthquakes, and other signs testify that the subterranean forces are not quite extinct. All the islands are coral-girt; and to the approaching navigator appear clothed to their very summits with a dense and luxuriant vegetation. The surface is generally hilly, and the soil, owing to abundant rain, is very productive. The windward sides of the islands are covered with thick forests, while to the leeward is a grassy country dotted here and there with screw-pines. The natural productions of Fiji or Viti are very varied, and the vegetation is, on the whole, tropical. The mountain districts are well adapted to the growth of coffee; rice can be grown in marshy land; the soil is well adapted for the sugar-cane, while cotton, tobacco, sweet potatoes, yams, arrow-root, maize, bread-fruit, plantain, the sago and cocoa palm, with other tropical productions, all thrive. These islands require only to be well worked by the capitalist to yield a golden harvest, as the coffee, cotton, and sugar industries are capable of extensive development. In 1880 there were at least seven sugar-mills at work, the product ranking well in the market. Of the plants yielding oil and fat, the most valuable is the cocoa-nut palm; the oil, copra, or dried nuts of which always command a good price. Each tree produces about 100 nuts, and is worth \$1 to \$1.50 a year to its proprietor. Edible roots are abundant, bread being made from them; but the yam is the staple article of food, by the ripening season of which the natives regulate their calendar. Timber suitable for house and ship building abounds. Copper, antimony, plumbago, and gold in small quantities have been found. Pearl fish exist in innumerable quantities near the coral-reefs, and fish and turtle are plentiful. There seem to be no indigenous animals; such live-stock as pigs, dogs, cattle, sheep, and fowls have been imported. The revenue of \$530,986 (1882) was reduced to \$315,491 (1887), and was only \$315,987 (1889). The annual exports fluctuated 1877-87 from \$826,200 to \$1,705,860, and the annual imports from \$1,511,460 to \$3,897,720. These figures include the total foreign trade, much of which was carried on with other British colonies. The public expenditures (1889) were \$286,705; imports \$890,454; exports \$1,832,113; public debt \$1,287,900. The chief articles of export are sugar (increasing), copra, cotton (not increasing), fruit, maize, coffee, cocoa-nut fibre, candle-nuts; while the imports embrace Manchester goods, ironmongery, cutlery, wine, beer, spirits, groceries, etc. There are excellent harbors, among which that of Levuka, the largest town, situated on Ovalau, lately provided with

FIJI ISLANDS.

a lighthouse, is most important. The capital is Suva, in the s. of Viti-levu.

The native inhabitants are for the most part Melanesians, with dark complexions and long frizzly hair; but considerable intermixture has taken place with the Polynesians of Tonga and Samoa, who have to some extent modified both the customs and language of the Fijians. They are tall, muscular, and well built, with regular features. They are very cleanly in their habits, and love the water. When first known by Europeans, they were in some respects civilized; but till lately human life was recklessly wasted, and nowhere was cannibalism so important an institution as here. The Fijians had priests, temples, a complex theology, and a firm belief in a future state. Human sacrifices were very common; and not merely enemies and strangers were slain to be eaten, but even wives, children, and friends were ruthlessly murdered and cooked. This state of things was in full force till about 1854. In 1835 the first Wesleyan missionaries landed on one of the Fiji Islands. Now, marvellous to relate, the bulk of the inhabitants are professing Christians, the only heathens being a few thousands in the interior of Viti-levu. Sir Arthur Gordon has declared that the Fijians are a Christian people. More than 102,000 are regular attendants at Wesleyan chapels; several thousands are Rom. Catholics; and other Christian churches have agencies here. The converts are said to be peaceable, well-behaved people. Cannibalism has disappeared since 1878; polygamy also has ceased; and peace seems everywhere to prevail. More than 800 churches have been built; and education is zealously promoted. Several interesting works on F. have lately been published, of which the more notable are *At Home in Fiji*, by Miss Gordon Cumming (1881); *A Year in Fiji*, by J. Horne (1881); and *Coral Lands*, by H. S. Cooper (1880).

The later history of Viti has been very tumultuous. In 1855, Thakombau, chief of Bau, was made responsible for a debt due from the natives to the Americans; and this resulted in his election to the dignity of 'Tui Viti,' or king of Viti. In 1857 he offered to cede Viti to Great Britain, in consideration of the payment of his debt to America, stipulating only for the retention of his title and authority over the natives. This offer was refused by the British government 1862, after sending out a deputation. A 'Polynesian Company' was then started, which undertook to clear off the debt, in return for certain valuable privileges, but ultimately collapsed. In 1869 the pres. of the United States refused the protectorate of the islands. From that date till 1873, the government sanctioned three or four unsuccessful constitutions. The cession of the islands to Britain was renewed 1873, and accepted, and 1874, Sep. 30, they were annexed as a crown colony. The small island of Rotumah (q.v.), annexed by Britain 1880, is now attached to the F. group.

The pop. (1871) was estimated 146,000, but an epidemic of measles introduced by a British man-of-war reduced that number by at least one-third 1875; (1881) natives 115,635,

FILADELFIA—FILCH.

whites 2,293, Polynesian laborers 6,318, inhabitants of Rotumah (annexed 1881) 2,500; (1889) 125,441 of all classes; revenue \$325,090, expenditure \$294,965, debt \$1,325,000, imports \$916,105, exports \$1,884,890.

FILADELFIA, *fē-lā-dēl' fē-ā*: town of s. Italy, province of Catanzaro, 18 m. w.s.w. from Catanzaro, on the w. side of the Apennines, and on a branch of the Angistola. Pop. 5,700.

FILAGO, n. *fī-lā'gō* [L. *filum*, a thread: from the delicate threads or *fila* which cover the plant]: in *bot.*, cudwort, genus of composite plants, chiefly annuals.

FILAMENT, n. *fīl'ā-mēnt* [F. *filament*; OF. *filamens*, a filament—from mid. L. *filamētum*—from L. *filum*, a thread: It. *filo*; F. *fil*, a thread]: a thread; a fibre; in *bot.*, the stalk which supports the anther. **FILACEOUS**, a. *-ā'shūs*, consisting of threads; composed of threads or thread-like fibres. **FILAMENTOUS**, a. *-mēntūs*, thread-like; bearing filaments. **FILAMENTARY**, a. *-tēr-ī*, formed by filaments. **FILAMENOID**, having the appearance of a filament; like a filament. **FILATORY**, n. *-tēr-ī*, a machine which spins thread. **FILIFORM**, a. *-ī-fawrm* [L. *forma*, shape]: slender like a thread. **FILATURE**, n. *fīl'ā-tūr*, spinning, especially of silk from the cocoon. **FILAR**, a. *fīl'er*, of or pertaining to a thread: specifically applied to a micrometer, microscope, etc., having threads or wires across its field of view. **FILOSE**, a. *fī'lōs*, ending in a thread-like process.

FILANDER, n. *fī-lān'dēr* [L. *filum*, a thread: from the slenderness of the tail]: species of short-tailed kangaroo (q.v.).

FILARIA: see GUINEA-WORM: THREAD-WORM.

FILBERT, n. *fīl'bērt* [corruption of *fill-beard*, a kind of nut which just fills the cup made by the beards of the calyx, the ordinary hazel projecting beyond the beard]: fruit of the cultivated hazel; a variety of the *Joryls avellānā*, ord. *Cupulifēra*, or *Corylācēa*: see HAZEL. *Note*.—A more likely origin is after *St. Philibert*, whose day is August 22, old style, the proper season for nuts—see Skeat.

FILCH, v. *fīlch* [Swiss, *flōke*, to bear away secretly: Norw. *pilka*; Scot. *pīlk*, to pick: Gael. *peallaid*, the skin of an animal (see PILCH)]: to steal something of little value; to pilfer. **FILCH'ING**, imp.: N. the act of stealing in a petty way. **FILCHED**, pp. *fīlcht*. **FILCH'ER**, n. one who. **FILCH'INGLY**, ad. *-lī*. *Note*.—Skeat prefers the derivation of *filch* from Icel. *fela*, to hide, to conceal: Goth. *filhan*, to hide, to bury.

FILE—FILING.

FILE, n. *fīl* [F. *fil*, a thread: OF. *file*, a rank, a row—from mid. L. *fila*, a string of things—from L. *filum*, a thread]: a line or wire on which papers are strung for preservation and reference; the number of papers so strung; a bundle of papers tied and titled: a row of soldiers ranged one behind another, as *rank* means a row of men ranged one beside another; but, generally speaking, two soldiers, the front and rear rank man, as in the ordinary formation at the present day a battalion stands two deep: the term is applied sometimes to one man in a single rank: a row; a series; a list: **V.** to range along a thread or string; to fasten together, as paper on a wire for preservation; to place officially among the records of a court. **FILING**, imp. placing on a string or in a bundle, as papers; marching in file, as soldiers. **FILED**, pp. *fild*. **TO MARCH IN FILE**, to follow one after another, and not abreast. **RANK AND FILE**, the body of private soldiers composing an army. **FILE-FIRING**, firing guns by one file at a time.

FILE, n. *fīl* [Dut. *vijl*; Dan *fīl*; Sw. *fil*, a file: O.H.G. *figila*—from *figen*, to rub: Bohem. *pila*, a saw—from *piliti*, to saw]: a well-known steel tool with a toothed or ridged surface for reducing, smoothing, or cutting any article, generally an article of metal: **V.** to rub or smooth with a file; to wear off by friction. **FILING**, imp. **FILED**, pp. *fild*, worked by the file; polished. **FILER**, n. one who. **FILE-BLANK**, piece of soft steel, shaped and ground ready for cutting, to form a file. **FILE-CARRIER**, tool-holder used to mount a file. **FILE-CLEANER**, scratch-brush of wire for cleaning files. **FILE-CUTTER**, one who makes files. **FILE-FISH**, same as *Balistes* (q.v.). **FILE-SHELL**, in *conch.*, bivalve mollusk of the genus *Pholas*. **FILE-STRIPPER**, machine for smoothing a worn-out file, preparatory to re-cutting. **FILINGS**, n. plu. *-lingz*, particles rubbed off with a file.

FILE, n. *fīl* [Gael. *file*, a bard, a poet—in the sense of an accomplished clever person (see **FILE 2**)]: in *OE.* and *modern slang*, an odd fellow; a clever person; a cheat.

FILE, v. *fīl* [contr. of *defile*, which see]: in *OE.*, to defile. **FILING**, imp. **FILED**, pp. *fild*, defiled; polluted.

FILE—FILING: a tool for rasping:—the act of applying it. A **FILE** is a steel tool, having its surface covered with teeth or serratures, and used for cutting down and shaping metals and other hard substances. There is little doubt that in the earliest stages of metal-working, when bronze implements first superseded those of stone, rough stones were used for the purposes to which files are now applied; nevertheless, the use of files dates from high antiquity. They are mentioned in the Old Testament, I. Sam. xiii. 21; also in the *Odyssey*. Files are of almost every conceivable shape, to suit the very varied purposes to which they are applied—flat, square, round or *rat-tail*, triangular, half-round, feather-edged, etc., besides being variously bent for intricate work. Nearly all these files are made thicker in the middle, or 'bellied,' the object of which will appear below. Files require to be made of the very best steel, which is first forged into the required shape, known as a

'blank,' then finished more accurately to the required form by grinding, planing, or filing. The blanks thus prepared and well softened (see TEMPERING) are next handed to the cutter, who sits astride on a low bench or stool, and has before him a stone anvil, with a flat piece of pewter laid upon it. The blank is held upon the anvil, with its tang toward the cutter, by means of a long loop of leather-strap, into which the cutter places his foot. He then cuts the teeth by striking with a hammer a short stout chisel, held obliquely at an angle of about 12° or 14° from the perpendicular. The object of this will be easily understood; for, if the chisel were perpendicular, a furrow like the letter V would be indented, and an equal burr struck up on each side; but instead of this, a cutting tooth like that of a saw, but with less obliquity, is required; this is effected by the obliquity of the chisel, and a burr is thrown up on one side only—viz., toward the tang. The surprising regularity observable in the distance between the teeth is secured in this way: The cutting is commenced at the point of the file; the chisel is then drawn backward, laid upon the blank, and slid forward, till it reaches the burr raised by the last cut; the blow is now struck, and another tooth and burr produced, which serves as a guide for the next cut; and so on. The distance between the teeth thus depends on the force of the blow and the obliquity of the cut; for the heavier the blow, the greater the ridge or burr, and the obliquity determines the distance of the cut from the burr; the skill of the workman consists, therefore, in the precise regulation of the blows. Most files are double cut—that is, they have two series of *courses* of chisel-cuts, which are oppositely inclined at an angle of about 55° to the central line of the file. The second course is made in the same manner as the first, but with lighter blows, and is usually somewhat finer than the first. This angular crossing converts the ridges into pointed teeth. Files used for soft metals which are liable to clog the teeth are single cut—that is, they have but one course of cuts. Taper files have the teeth finer toward the point. Rasps for wood are cut with pointed chisels; each tooth being an angular pit with a strong burr, instead of a long furrow. The newly cut teeth in the soft steel are preserved from injury by being laid upon the softer pewter block before referred to. The rapidity with which the blows are struck varies with the fineness of the file; 60 or 80 cuts are commonly made per minute.

Files have to be very carefully hardened and tempered. If heated too strongly, or made too hard, the steel is so brittle that the teeth tear off; if too soft, they wear down rapidly, and the file soon becomes useless. Great care is required also in keeping them straight, as the sudden cooling necessary for hardening is very apt to warp the steel. At first sight, it would appear, from the simplicity and continual repetition of the movements required in file-cutting, and the precision and regularity of the work, that it is an operation specially adapted for machinery. Many attempts have been made to cut files by machinery, but with

FILE-FISH—FILIAL.

only partial success; the chief difficulty arises from the necessity of modifying the force of the blow to suit the hardness of the steel. It is practically impossible to supply a large number of blanks all of exactly the same hardness; and if the machine be adjusted to suit the hardness of one blank, it may strike too heavy or too light a blow for the next; whereas the workman *feels* at once the hardness of the steel he is working upon, and adjusts his blows accordingly.

FILING, to the uninitiated, may seem a simple operation of rubbing one piece of metal on another, requiring only muscular strength and no skill. This is far from being the case, for a skilful workman will, in a given time, with a given amount of muscular work, cut away a far greater quantity of metal with a file than one who is unskilful, for he makes every tooth *cut into* the work, instead of *rubbing over* it. To do this he must adapt the pressure and velocity of motion of the file to the coarseness of its teeth, and the hardness, brittleness, and toughness of the material he is working upon. To *file flat*, that is, to avoid rounding the sharp edges of a narrow piece of work, is very difficult, and some years of continual practice, are required before an apprentice can do this well, especially in 'smoothing up' or finishing work before polishing, and there are some who never succeed in filing, smoothing, and polishing without rounding the edges of fine work. The power of doing this constitutes the main test of skill among mathematical instrument makers and other metal-workers. The flattest surface can be obtained by laying the work, where its form admits, upon a piece of cork held in the vice, and filing it with *one hand*, the pressure on the file being communicated by the forefinger. It is mainly to aid the workman in filing flat that the rounded or belled form is given to files: this partially compensates the tendency of the hands to move in a curved line with its convexity upward when they move forward and apply pressure, as in the act of filing.

FILE-FISH: see BALISTES.

FILEY, *fī'li*: watering-place on the Yorkshire coast, England, eight m. s.e. of Scarborough. A promontory shelters the bay from n. winds; and F. has been recommended as a good place for a great harbor of refuge. Pop. (1881) 2,337.

FILIAL, a. *fīl'ī-āl* [F. *filial*—from mid. L. *filialis*—from L. *filii*s, a son, *filia*, a daughter], pert. to a son or daughter. FIL'ALLY, ad. *-lī*. FILIATION, n. *fīl'ī-ā'shūn* [F.—L.]: relation of a child to a father; correlative of paternity; the act of ascribing a child to a father; affiliation: in the *law of Scotland*, process by which the paternity of a child is determined. The general rule that the father is he whom the marriage points out (*pater est quem nuptiæ demonstrant*), is a presumption which may be overcome by showing its impossibility in fact in the specific case. See EVIDENCE: SEMIPLENA PROBATIO. FILI'ETY, *-ī'ē-tē*, sonship.

FILIBUSTER—FILIGREE.

FILIBUSTER, or **FILLIBUSTER**, n. *fīl'ī bū'stēr* [F. *flibustier*, a freebooter: Sp. *filibuster*]: one who unites with others in attacking a foreign country in time of peace for plunder or conquest; a marauder; a freebooter—see *Note* under **FREE**. **F.**—meaning a sort of piratical adventurer, but acting sometimes under a pretense of seeking some public good—may be regarded as the modern designation, especially in the United States, for one of the class known formerly as *Buccaneers* (q.v.). *Note.*—**FILIBUSTER** is said to be from the Sp. *filibote*, or *flibôte*, a fly-boat, which the Spaniards adopted from the Eng. *fly-boat*, of which it is a mere corruption.

FILICAJA, *fē-lē-kā'yā*, **VINCENZO**: 1642–1707, Sep. 24; b. Florence, of an ancient but impoverished family: lyrical poet. A disappointment in love, in his youth, led him to turn from amatory poetry to heroic, martial, and sacred themes. These odes, published in Florence 1684, made him famous, and procured for him the liberal patronage of Queen Christina of Sweden. Patriotic sonnets—grandest among which is his lament over Italy—*Italia, Italia, O tu cui feo la sorte*—and heroic odes, severely classic in form, are the chief works of Filicaja. In advanced age, he was appointed judge and senator, and 1702 was called to one of the highest magisterial offices in Florence, where he died. His works, under the title of *Poesie Toscane di Vincenzo da Filicaja, Senatore Fiorentino e Accademico della Crusca*, were published after his death. The best edition is that of Venice (2 vols. 1762), containing both the Italian and Latin verses of the author.

FILICES, n. plu. *fīl'ī-sēz* [L. *filix*, a fern, *filicēs*, ferns]. the fern-tribe (see **FERNS**). **FIL'ICAL**, a. -*kal*, of or pertaining to the Filices, or Ferns: as the *Filical Alliance*. **FILICALS**, -*kā'lēz*, an alliance of Acrogens, containing the Ferns. **FIL'ICOID**, a. -*koyd* [Gr. *eidos*, form]: resembling a fern. **FILICITES**, n. plu. *fīl'ī-sitz* or *fīl'ī-sī'tēz*, fossil ferns. **FILICIC ACID**, the dibutyric ether of phoroglucin.

FILIFORM, a.: see **FILAMENT**.

FILIFORMIA, n. *fīl'ī-fawr'mī-a*: in *zool.*, one of the two sections of crustaceans into which the order *Læmodipodia* is divided. They are distinguished by their long thread-like body and slender legs.

FILIGREE, n. *fīl'ī-grē* [F. *filigrane*—from It. and Sp. *filigrana*, a kind of texture made of gold or silver wire—from *filo*, wire; *grano* the direction of fibres of wood: L. *filum*, a thread, *grānum*, a grain]: very fine ornamental threadlike work made of gold or silver wire, which is twisted into spirals and other convoluted forms; and these spirals, etc., are combined to form a sort of metallic lace-work, which is shaped into brooches, earrings, crosses, head ornaments, and others of a very light and elegant character. This work is chiefly done in Malta, India, Genoa, the Ionian Islands, and some parts of Turkey. It sometimes receives the general name of *Multese work*.—F. work is of great antiquity: it has been found in the tombs of Thebes; and specimens of Greek and Etruscan work,

FILIOQUE.

3,000 years old show perfect execution. The art was highly developed in central Asia also from the most remote times. The Irish F. work reached its perfection in the 10th and



Filigree Ornaments.

From a drawing by M. Mariana, in the Florence Exhibition (1861)

11th c.: beautiful specimens are in the Royal Irish Acad. at Dublin, and the 'Tara Brooch' is well known. FILIGREE, in *sculp.*, fine threadlike work. FILIGREED, a. ornamented with filigree.

FILIOQUE, *fīl-ī-ō'kwē* (in English 'and from the Son'): an addition to the original statement of the Nicene Creed. The first general council (at Nicæa 325), called with special reference to the controversy concerning the divinity of Christ, naturally gave that subject its chief attention. Consequently the creed that it adopted, while declaring the Son to be of one substance with the Father, simply affirmed faith also in the Holy Spirit without attempting to define his essential being. But subsequently earnest discussions concerning the Holy Spirit were greatly multiplied and prepared the way for his being described by the second general council (at Constantinople 381) as the Spirit 'proceeding from the Father.' These words of Christ were assumed to refer to the Spirit's essential being and consequently to teach that the source of that is in the Father only. Though this was the prevailing view in the Greek Church, among the Latins the tendency was to say that the Spirit's proceeding or issuing forth is also from the Son. This, Augustin affirmed, and by his great influence, did much to establish. At length, 589, the synod of Toledo (not a general council) added the words 'filioque' to the creed. This addition pope Leo III. in 809, against

FILIPENDULOUS—FILLAN.

the arguments and entreaties of Charlemagne refused to sanction though he affirmed the doctrine sound and Scriptural. When, two centuries later (1014), the papal assent was yielded the addition was not made in writing, but was chanted during high mass at the coronation of Henry II. In the Eastern Church the clause was rejected, though some eminent men admitted that the procession of the Spirit from the Father is through the Son. After the schism between the East and the West (accomplished in the 11th c. and of which the doctrinal difference expressed by the addition of 'filioque' to the creed was one of the causes), repeated efforts to effect a reconciliation were made without success. Yet both churches profess belief in the existence and divinity of the Holy Spirit, and, on that subject, differ from each other only in their attempts to express mysteries concerning which all human minds are equally ignorant. Since the Reformation, Protestant churches accept the creed with 'filioque' retained. They who would rightly estimate this controversy must bear in mind that the words on which it is founded, 'who proceedeth from the Father' are understood by many as referring only to the mission of the Spirit among men and consequently as not revealing anything concerning the essential relation of the Spirit to the Father or the Son.

FILIPENDULOUS, a.: hanging or suspended by a thread; in *bot.*, seemingly suspended by or strung on a thread; applied to tuberos swellings in the middle or at the extremities of slender thread-like rootlets.

FILIPO-D'ARGIRO, *fē-lip'pō-dār-jē'rō*, **SAN**: town of Sicily, province of Catania, about 30 m. w.n.w. of the town of Catania; on the right bank of the Traina, in an exceedingly fertile district. It contains a ruined Saracenic castle, and several religious edifices. Saffron of good quality, and in considerable quantity, is grown in the vicinity. **SAN F.** stands on the site of the ancient Sikelian city of Agrigum, birthplace of Diodorus Siculus, and which, about B.C. 400, is said to have had 20,000 citizens. Present pop. 12,000.

FILITELÆ, n. *fīl-ī-tē'lē* [L. *filum*, a thread; *tela*, a web]: tribe of spiders noted for the construction of their web.

FILL, v. *fīl* [AS. *fyllan*, to replenish: Icel. *fylla*; Ger. *füllen*, to fill: Lith. *pillu*, to pour into]: to put or pour in all that can be held; to crowd; to stuff; to content or satisfy; to hold or occupy, as any post or office; to supply the holder of the office; to engage or employ as time; to become full: N. as much as satisfies fully. **FILL'ING**, imp.: ADJ. caus. ing fulness or satiety: N. act of making full; act of growing full. **FILLED**, pp. *fīld*. **FILL'ER**, n. one who, or that which. **TO FILL FULL**, to fill completely; to surfeit. **TO FILL UP**, to fill to the brim or entirely; to complete; to grow or become quite full; to occupy the whole space. **TO FILL OUT**, to enlarge.

FILLAGREE: see **FILIGREE**.

FILLAN, *fīl'an* **SAINT**. or **SAINT FAOLAN** (surnamed

FILLAN.

rne Leper): a Scoto-Irish ecclesiastic, whose yearly festival is on June 20. His chief church in Scotland was at the e. end of Loch Erne, in Perthshire, where 'St. Fillan's Well' was long believed to have supernatural powers of healing. A seat in the rock of Dunfillan still keeps the name of 'St. Fillan's Chair;' and two cavities beside it are said to have been hollowed by St. F.'s knees in prayer. His Irish church is Ballyheyland (anciently called Killhelan or Kill Faelain), in the barony of Cullenagh, in Queen's county.

FILLAN, SAINT, the Abbot: Scoto-Irish saint of the 8th c.; son of St. Kentigerna of Inchcaileach, in Loch Lomond. His yearly festival is on Jan. 7 or 9. He joined the monastery of St. Mund on the Holy Loch, and after that saint's death succeeded him as abbot. His chief church in Scotland was in Perthshire, in the upper part of Glendochart, which takes from him the name of Strathfillan. Here, a well-endowed priory, dedicated in his honor, was repaired or rebuilt in the beginning of the 14th c. King Robert Bruce made a grant of money to the work, in gratitude, probably, for the miraculous encouragement which he was said to have received on the eve of Bannockburn from a relic of the saint—one of his arm-bones enclosed in a silver case. Another relic of St. F.—the silver head of his crosier, or pastoral staff—has been preserved to our time. It is called the 'Coygerach' or 'Quigrich,' and appears in record as early as 1428, when it was in the hereditary keeping of a family named Jore or Dewar, believed to have been its keepers from the time of King Robert Bruce. They had half a bowl of meal yearly from every parishoner of Glendochart who held a merk land, and smaller quantities from smaller tenants; and they were bound, in return to follow the stolen cattle of the parishoners wherever their traces could be found within the realm of Scotland. The Quigrich, besides its virtues in the detection of theft, was venerated also for its miraculous powers of healing. In 1487, the right of keeping it was confirmed to Malice Doire or Dewar by King James III. in a charter which was presented for registration among the public records of Scotland so lately as 1734. Sixty years later, the Quigrich still commanded reverence, but its healing virtues were tried only on cattle, and its once opulent keepers had fallen to the rank of farm-laborers. It was publicly exhibited in Edinburgh 1818, before being carried to Canada by its hereditary keeper Archibald Dewar. His son, Alexander Dewar, desirous that it should be restored to Scotland, came to an arrangement whereby, partly by purchase and partly by gift, it became the property of the Soc. of Antiquaries of Scotland. It was described by Dr. Daniel Wilson in a paper in the *Canadian Journal*, No. xxiv., reprinted as *The Quigrich, or Crosier of St. Fillan* (Toronto, 1859); see also *Historical Notices of St Fillan's Crosier* by Dr. Stuart, reprinted from the *Proceedings of the Society of Antiquaries of Scotland*, vol. xii. (1877). A linn in the river Fillan or Dochart, in Strathfillan was long believed to work wonderful cures on insane persons, who were immersed in the stream at sunset. and left

FILLET—FILLMORE,

bound hand and foot till sunrise in the ruins of the neighboring church of St. Fillan.

FILLET, n. *fīl'let* [**F** *fillet*, dim. of *fil*, a thread—from L. *fīlūm*, a thread]: a little band, such as may be put round the head; in *arch.*, a small space or band like a narrow ribbon, used with moldings; a narrow ornament or molding; in *her.*, an ordinary which, according to Guillim, contains the fourth part of the chief; in *dairy*, perforated curb to confine the curds in making cheese; in *die-sinking*, ribbon of metal of gauged proportions fed to the machine which punches out the planchets for coining; in *gilding*, band of gold-leaf on a picture-frame or elsewhere; in *mach.*, the thread of a screw; in *manège*, the loins of a horse, beginning at the place where the back part of the saddle rests: **V.** to bind with a little band; in *arch.*, to adorn with a band or astragal. **FIL'LETING**, imp. **FIL'LETED**, pp. **FILLET**, n. [**F** *fillet*, the band of flesh which lies along under the backbone of an animal]: a boneless lump of flesh bound together by a fillet or bandage; the fleshy part of the thigh in veal.

FILLIBEG, or **PHILIBEG**, n. *fīl'ibēg* [Gael. *filleadh*, plait or fold; *beg*, little]: the kilt of the Highlanders of Scotland, reaching nearly to the knees. *Note*.—The *sporrán* is the pouch in front of the kilt.

FIL'LIBUSTERS: see **FILIBUSTER**.

FILLIP, n. *fīl'lip* [an imitation of the sound: from **FLIP**]: a stroke with the finger-nail suddenly let go from the thumb: **V.** to strike smartly with the finger suddenly thrown outward from its bent position inward to the thumb. **FIL'LING**, imp. **FIL'LIPED**, pp. *-līpt*.

FILLIPEEN: see **PHILOPENA**.

FILLISTER, n. *fīl'is-ter*: in *carp.*, rabbet on the outer edge of a sash-bar, to hold the glass and the putty; plane for making a rabbet.

FILLMORE, *fīl'mōr*, **MILLARD**: President of the United States; 1800, Jan. 7—1874, Mar. 8 (pres. 1850, July 9—1853, Mar. 4); b. at Summer Hill, N. Y. Born of English parents, in rather straitened circumstances, all his education was in the village school. At the age of 15 he was sent to Livingston co., to learn the drapery trade, and soon afterward was bound apprentice to a wool-carder in his native village. During four years at this occupation, he used every means at his disposal to cultivate his mind, devoting his evenings to reading and study. In his 19th year he made the acquaintance of a lawyer named Wood, who discovering in the young man talents worthy of a loftier sphere, took an interest in him, and offered him a situation in his office, at the same time supplying him with funds for the prosecution of his studies for the legal profession. F. entered with ardor on the course marked out for him, and in order that he might not be too great a burden upon his friend, applied a part of his time to teaching school. He removed to Buffalo 1821 to complete his studies, and 1823 was admitted a member of the bar. He grad-

FILLY—FILOSELLE.

ually acquired reputation, and in 1829, he began his political career, being in that year chosen a representative of Erie co. in the legislature of N. Y., where he entered the ranks of the whig party, at that time in opposition. Here his probity and modesty soon gained universal esteem. He was mainly instrumental in procuring in N. Y. the abolition of imprisonment for debt. In 1832, F. was elected a member of congress; and he was several times re-elected; but in 1844 he resumed his profession. In 1847, however, he returned to public life, being elected by a large majority to the post of comptroller of N. Y. and in the following year he was the whig candidate for vice-pres. of the United States, on the ticket with Gen. Zachary Taylor for pres. The whigs were successful, and F. entered on his office 1849, Mar. 5. By the unexpected death of General Taylor, 1850, July 9, F. became president. His presidency was creditable in its aims, and in many of its measures, notwithstanding that his party were in the minority in congress, and that the shadow of the coming war was even then beginning to darken the land and confuse legislation with bitter partisanship and continuous attempts at an impossible compromise. F. promoted as far as he could the progress of exploration and discovery, at home and abroad. In 1855, he visited Europe, and on his return 1856, he was again nominated for the presidency, but failed of election. F. took no active part in the civil war; though nominally he sided with the Union. After the close of his presidential term, he returned to Buffalo, where he died.

FILLY, n. *fʲilʲlʲ* [prov. Dan. *fyllie*; Icel. *fylja*, a filly—from *foli*, a foal]: a young mare, as opposed to a colt or young horse; a wanton girl.

FILM, n. *fʲilm* [AS. *film*, a skin: Fris. *fiemel*, the skin of the body: W. *pilen*, rind]: a thin skin: V. to cover with a thin skin. **FIL'MING**, imp. **FILMED**, pp. *fʲilmd*. **FILMY**, a. *fʲil'mi*, composed of thin skins or membranes. **FIL' MINESS**, n.

FILOSE, a.: see **FILAMENT**.

FILOSELLE, n. *fʲilʲlʲ-ɛɛlʲ* [F.]: a kind of floss-silk.

FILTER—FILTRATION.

FILTER, n. *fīl'tēr* [F. *filtrer*, to filter—from mid. L. *filtrum*, a bit of *felt*, or other stuff through which to strain liquids: It. *feltro*, a felt, a filter]: any open porous substance, as cloth, paper, sand, or gravel, through which a liquid may drain; a strainer: V. to purify; to pass through a filter. **FIL'TERING**, imp.: N. act of passing through a filter. **FIL'TERED**, pp. *-tērd*, strained. **FIL'TRATE**, v. *-trāt*, to strain; to filter. **FILTRA'TION**, n. *-trā'shūn* [F.—L.]: the act or process of filtering.

FIL'TER—FILTRATION: the substance or apparatus through which liquid is strained:—the process of such straining. When solid matter is suspended in a liquid in which it is insoluble, it may be separated by various means. For various methods of causing such suspended matter to collect together and sink to the bottom or float on the surface, and thereby clearing the liquid, see **FINING**. The process of filtration consists in passing the liquid through some porous substance, the interstices of which are too small to admit of the passage of the solid particles, the principle of the action being the same as that of a sieve; but as the particles of fluids are immeasurably small, the pores must be extremely minute.

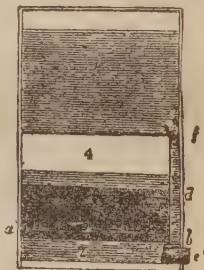
One of the simplest forms of filter is that commonly used in chemical laboratories for separating precipitates, etc. A square or circular piece of blotting-paper is folded in four, the corner where the four holds meet is placed downwards in a funnel, and one side is partly opened, so that the paper forms a lining to the funnel. The liquid passes through the pores of the paper, and the solid matter rests upon it. The chief advantages of this filter are its simplicity, and the ease with which the solid matter may be removed and examined. A simple water-filter for domestic purposes is sometimes made by stuffing a piece of sponge in the bottom of a funnel or the hole of a flower-pot, and then placing above this a layer of smooth pebbles, then a layer of coarse sand, and above this a layer of pounded charcoal three or four inches in depth. Another layer of pebbles should be placed above the charcoal, to prevent it from being stirred up when the water is poured in. It is obvious that such a filter will require occasional cleaning, as the suspended impurities are left behind on the charcoal, etc. This is best done by renewing the charcoal, etc., and taking out the sponge and washing it. By a small addition to this, a cottage-filter may be made, which, for practical use, is quite equal to the most expensive filters of corresponding size. It consists of two flower-pots, one above the other; the lower one is fitted with the sponge and filtering layers above described, and the upper one with a sponge only. The upper pot should be the largest, and if the lower one is strong, the upper one may stand in it, or a piece of wood with a hole to receive the upper pot may rest upon the rim of the lower one. The two pots thus arranged are placed upon a three-legged stool with a hole in it, through which the projecting part of the lower sponge passes, and the water drops into a jug placed below. The upper pot serves as a reservoir, and its sponge stops

FILTER—FILTRATION.

the coarser impurities, and thus the filtering layers of the lower one may be used for two or three years without being renewed, if the upper sponge be occasionally cleaned. Care must be taken to wedge the upper sponge tightly enough, to prevent the water passing from the upper pot more rapidly than it can filter through the lower one.

A great variety of filters are made on a similar principle to the above, but constructed of ornamental earthenware or porcelain vessels of suitable shape. In purchasing a filter, the buyer must not be satisfied with merely seeing that the water which has passed through it is rendered perfectly transparent—this is easily done by a new and clean filter—but he should see that the filter is so constructed as to admit of being readily cleansed, for the residual matter must lodge somewhere, and must be somehow removed. When large quantities of water have to be filtered, this becomes a serious difficulty, and many ingenious modes of overcoming it have been devised. In most of these, water is made to *ascend* through the filtering medium, in order that the impurities collected on it may fall back into the impure water. Leloge's ascending filter consists of four compartments, one above the other; the upper part, containing the impure water, is equal in capacity to the other three. This communicates by a tube with the lower one, which is of small height, and whose top is formed by a piece of porous filtering-stone, through which

alone the water can pass into the third compartment, which is filled with charcoal, and covered with another plate of porous stone. The fourth compartment, immediately above the third, receives the filtered water, which has been forced through the lower stone, the charcoal, and the upper stone. A tap is affixed to this, to draw off the filtered water, and a plug to the second or lower compartment, to remove the sediment. In the diagram



Leloge's Filter:

1, 2, 3, 4, the four compartments; *ab*, the first porous stone of third or filtering compartment; *cd*, the exit filtering stone of *d*; *e*, the plug to remove for cleaning out second compartment; *f*, a loose sponge at entrance of communication tube.

Bird's Siphon Filter is a cylindrical pewter vessel containing the filtering media, and to it is attached a long coil of flexible pewter pipe. When used, the cylinder is immersed in the water-butt or cistern, and the pipe uncoiled and bent over the edge of the cis-

FILTER—FILTRATION.

tern, and brought down considerably below the level of the water. It is then started by applying the mouth to the lower end, and sucking it till the water begins to flow, after which it continues to do so, and keeps up a large supply of clear water. This, of course, is an ascending filter, and the upward pressure is proportionate to the difference between the height of the water in the cistern and that of the lower end of the exit tube: see SIPHON. Sterling's filtering tanks are slate cisterns divided into compartments, the water entering the first, then passing through a coarse filter to a second, and thence through a finer filter to the main receptacle, where the filtered water is stored and drawn off for use.

A common water-butt or cistern may be made to filter the water it receives by the following means: Divide the cistern or butt into two compartments, an upper and a lower, by means of a water-tight partition or false bottom: then take a wooden box or small barrel, and perforate it closely with holes; fit a tube into it, reaching to about the middle of the inside, and projecting outside a little distance; fill the box or barrel with powdered charcoal, tightly rammed and cover it with a bag of felt; then fit the projecting part of the tube into the middle of the false bottom. It is evident that water can pass from the upper to the lower compartment only by passing through the felt, the charcoal, and the tube, and thus, if the upper part receives the supply, and the water for use is drawn from the lower part, the whole will be filtered. It is easily cleaned by removing the felt and washing it.

Various means of compressing carbon into solid porous masses have been patented, and filters are made in which the water passes through blocks of this compressed carbon. Most of these are well adapted for the purpose, but their asserted superiority over filters composed of layers of sand and charcoal is doubtful. An elegant and convenient portable filter for soldiers, travellers, and others who may require to drink from turbid ponds and rivers, was constructed of Ransome's filtering stone, and is made also of the compressed carbon. A small cylinder of the stone or carbon is connected with a flexible India-rubber tube in such a manner that the cylinder may be immersed in a river, the mouth applied to a mouth-piece at the other end of the tube, and the water drawn through the filtering cylinder.

For the filtration of water on a large scale, see WATER-SUPPLY.

Some very interesting experiments were made by Mr. H. M. Witt, to ascertain whether soluble matter, such as common salt, is in any degree removed from water by filtration. Theoretically, it has been assumed that this is impossible, since the filter acts only mechanically in stopping suspended particles; but the results of Mr. Witt's experiments show that 5 to 15 per cent. of the soluble salts were separated by sand filters such as above described. This is a curious and interesting subject, worthy of further investigation. Another most important matter, on which

FILTER—FILTRATION.

a series of accurate experiments is required, is to ascertain to what extent soluble organic matter may be decomposed by filtration, especially by charcoal filters, and to ascertain how long charcoal and other porous matter retains its property of acting on organic matter in watery solution. The power of dry charcoal in decomposing organic matter in a gaseous state is well established (see below), and it is also well known that fresh charcoal acts powerfully upon organic matter in solutions, but the extent to which this power is retained in the charcoal of a filter in continuous action has not been ascertained. This is of the highest importance, as it sometimes happens that water of brilliant transparency, and most pleasant to drink, on account of the carbonic acid that it contains, is charged with such an amount of poisonous organic matter as to render its use as a daily beverage very dangerous. Charcoal obtained from burning bones is more efficacious than charcoal from wood. A filter of animal charcoal will render London porter colorless. Loam and clay have similar properties. Prof. Way found that putrid urine and sewer-water, when passed through clay, dropped from the filter colorless and inoffensive.

When a liquid contains mucilaginous or other matter having viscous properties, there is considerable difficulty in filtering it, as the pores of the medium become filled and made water-tight. Special filters are therefore required for syrups, oils, etc. Such liquids as ale, beer, etc., would be exceedingly difficult to filter; therefore they are clarified by the processes described under *FINING*. Oil is usually passed through long bags made of twilled cotton cloth (Canton flannel). These are commonly 4 to 8 ft. long, and 12 to 15 inches in diameter, and are inclosed in coarse canvas bags, 8 to 10 inches in diameter, and thus the inner filtering-bag is corrugated or creased, and a large surface in proportion to its size is presented. Syrups are filtered on a small scale by confectioners, etc., by passing them through conical flannel bags, and on a large scale in the *creased bag-filter* above described. Thick syrups have to be diluted or clarified with white of egg, to collect the sediment into masses, and then they may be filtered through a coarse cloth strainer. Vegetable juices generally require to be treated in this manner.

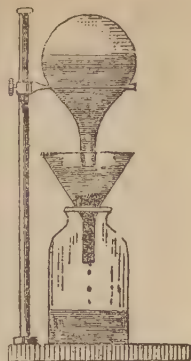
The simple laboratory filter has to be modified when strong acid or alkaline solutions, or substances which are decomposed by organic matter, require filtration. Pure silicious sand, a plug of asbestos, pounded glass, or clean charcoal, are used for this purpose. Böttger recommends gun-cotton as a filter for such purposes. He has used it for concentrated nitric acid, fuming sulphuric acid, chromic acid, permanganate of potash and concentrated solutions of potash and aqua regia. He says that properly prepared gun-cotton is attacked at ordinary temperature by only acetic ether.

Filtering paper for laboratory purposes requires to be freed from inorganic impurities that are soluble in acids, etc.; this is effected by washing the paper with hydro-

FILTH—FILUM AQUÆ.

chloric acid, or, when thick, with nitric and hydrochloric acid, and removing the acid by washing thoroughly with distilled water.

When a considerable quantity of liquid has to pass through a filter, it is sometimes desirable that it should be made to feed itself. In the laboratory this is done by inverting a flask filled with the liquid over the filtering funnel, the mouth of the flask just touching the surface of the liquid when at the desired height in the funnel. As soon as it sinks below this, air enters the flask, and some liquid falls into the funnel. On a large scale, self-acting filters are fed by the common contrivance of a ball-cock and supply-pipe.



Air Filters.—The extraordinary powers of charcoal indisinfecting the gaseous products evolved from decomposing animal and vegetable matter, have been made available by Dr. Stenhouse in an apparatus for purifying air that is made to pass through it. A suitable cage, containing charcoal in small fragments, is fitted to the opening from which the deleterious gases issue, and is found to render them perfectly inodorous, and probably innocuous. The first application of this was made 1854, when a charcoal air-filter was fitted up in the justice-room of the Mansion House, London, the window of which opens above a large urinal, the smell of which was very offensive in the room. The filter at once destroyed the nuisance, and the charcoal has been found to last many years without the need of renewal. 103 such filters have been applied to the outlets of the sewers of one district of the city of London, and no bad smell is observable where they are placed, and no obstruction offered to the ventilation of the sewers. They have been applied with like results in two or three county towns. The subject is fully treated by Dr. Stenhouse in a letter to the lord mayor, published by Churchill (London). Charcoal respirators are small air-filters of the same kind applied to the mouth: see RESPIRATOR.

FILTH, *n.* *fīlth* [AS. *filth*, filth; Icel. *fyla*, to stink, to putrefy (see FOUL)]: dirt; defilement; foul matter; anything which pollutes the mind. **FILTHY**, *a.* *fīl' thī*, foul; dirty; unclean; morally impure. **FILTHILY**, *ad.* *-lī*, foully; grossly. **FILTHINESS**, *n.* nastiness; corruption; impurity. —**SYN.** of 'filthy': foul; impure; polluted; nasty; muddy; miry; sloughy; squalid; gross; sluttish; vulgar; licentious.

FILUM AQUÆ, *fī' lūm ā' kwē* [Lat., thread of water]: legal expression, meaning the boundary line determined by a stream of water flowing between the land of two separate owners. Where an unnavigable stream or where a navigable stream above the point where the tide ebbs and flows is cited as the boundary between the separate portions of land lying opposite to each other on its shores, each owner

FIMBRIATE—FINAL JUDGMENT.

is held to possess the land to the centre or axis of the stream. This imaginary line is called in legal parlance *filum aque*. This ownership applies only to the land beneath the water; no right of disturbing the stream beyond the extent involved in ordinary use of the water is implied. If an island forms in the middle of the stream each riparian owner has a right to one-half thereof. In some of the states the courts hold that the *filum aque* only exists in unnavigable streams, and that the state owns the beds of all navigable rivers, even though they are unaffected by the tide.

FIMBRIATE, a. *fīm'brī-āt*, or FIM'BRIATED, a. [L. *fimbriæ*, threads, fringe]: fringed at the margin; bordered; in *her.*, said of an ordinary having a narrow border or edging of another tincture. FIM'BRIÆ, n. plu. *-brī-ē*, in *anat.*, a structure resembling a fringe. FIMBRILLIFEROUS, a. *-brīl-līf'ēr-ūs*, in *bot.*, bearing numerous little fringes, as the receptacle of some composites.

FIN, n. *fīn* [AS. *finna*; Dan. *finne*; L. *pinna*, a fin—see letter F]: the membrane or limb of a fish for support and locomotion (see FINS). FINNER, or FINBACK, any whale which has an adipose fin on its back. The genera *Megaptera*, *Balænoptera*, and *Physalus* have this character. They all belong to the family *Balænidæ*. FINNED, a. *fīnd*, having fins. FINNY, a. *fīn'nī*, furnished with fins. FIN'LESS, a, without fins. FIN-FISH, sailor's name for some of the fin-backed whales, especially for the Northern Rorqual, or Razor-backed Whale. FIN-FOOT, in *zool.*, *Heliornis*, genus of S. American and Burmese birds belonging to the family *Rallidæ* or rails. FIN-PIKE, the *Polypteri*, subfamily of ganoid fishes. FIN-SCALE, a name given to the rudd or red-eye. FIN-RAY, the rigid part of the fin in fishes. FIN-FOOTED, web-footed; having membranes between the toes.

FINABLE: see under FINE 1.

FINAL, a. *fī'nāl* [F. *final*—from L. *finālis*—from *fīnīs*, an end]: last; conclusive; pertaining to the end. FI'NALLY, ad. *-lī*. FINALITY, n. *fī'nāl'i-tī*, the state of being final; completeness. FINALE, n. *fī-nā'lā* [It.]: close; termination; that part of a musical composition which finishes the act of an opera; also the last movement of an instrumental composition, as in the symphony, quartet, quintet, sonata, etc. The character of the finale, in purely instrumental works, is always lively: in the opera, it depends on the subject; in some operas the finale consists of an aria alone, as in Mozart's *Figaro*, instead of the usual full concerted music for soli and chorus. FINAL CAUSE: see TELEOLOGY.—SYN. of 'final': ultimate; latest; decisive; terminating.

FINALE, *fē-nā'lā*: town of n. Italy, province of Modena, on the Panaro, 22 m. n. e. from Modena. It is surrounded by walls, has manufactures of linen and silk, and an active general trade. Pop. 4,500.

FI'NAL JUDGMENT. The meaning of this term in the law of Scotland having led to some dispute, an Act of Sederunt (q.v.) was passed on the 11th July, 1828, declar-

FINANCE.

ing it to be applicable to a case in which 'the whole merits of the cause have been disposed of, although no decision has been given as to expenses, or, if expenses have been found due, although they have not been modified or decerned for.' The importance of the definition arises from the fact that only final judgments can be carried by advocacy from the inferior to the superior courts. 'The whole merits of the cause' has been held to mean, not only the merits of the action to which the advocator is a party, but also those of any other conjoined with it. If the parties in the conjoined action will not proceed to have it determined, the advocator ought to apply to the inferior judge, stating his intention to advocate, and praying him to call on the parties to proceed with the conjoined process; and, failing their doing so, to disjoin the causes, which disjunction will render an advocacy competent. Shand's *Practice*, i. p. 454. In Advocations (q.v.) and Suspensions (q.v.), if the record be closed, and the proof concluded in the inferior court, the case may be taken at once to the Inner House without a judgment of the Lord Ordinary, 13 and 14 Vict. c. 36. In order to warrant an appeal to the circuit court in a civil cause (where otherwise competent) not only the merits must have been disposed of, but the expenses modified and decerned for.

FINANCE, n. *fī-nāns'* [OF. *finance*, wealth, an exaction, a compulsory payment—from mid. L. *financiā*, a payment—from *finirē*, to pay a fine or tax—from mid. L. *finis*, the termination of a suit in law, the money paid as the price of settlement—from L. *finis*, the end: OF. *finer*, to pay an exaction or composition]: revenue; income: V. among *commercial men*, to raise money or funds, generally for a special or speculative object. FINAN'CI'NG, imp. FINANCED, pp. *fī-nānst'*. FINANCES, n. plu. *fī-nāns' sēz*, income or resources, funds in the public treasury. FINANCIAL, a. *fī-nāns'shāl*, pertaining to public revenue or income. FINAN'CIALLY, ad. *-lī*. FINANCIER, n. *fī-nāns'sēr*, one skilled in the principles of banking, or in the management and raising of the public revenue.

FINANCE: science or art of managing money matters. F. in the plural, finances, is often used for money itself, but still with a reference to the purpose to which it is to be applied, as where the finances of a country are said to have improved or fallen off—that is to say, have become abundant or scanty according to the expenditure of the country. Sometimes the word is applied to private wealth, but it is properly applicable to public funds. In Britain and the United States, it is used rather in a political and economic sense than officially, but in France there have been, from time to time, comptrollers-gen. of finance, councils of finance, bureaux of finance, etc. Many statesmen have been spoken of as great financiers, from the talent which they have shown for adjusting national revenue and expenditure, as Colbert, Turgot, and Necker in France, Godolphin and Peel in Britain, and Hamilton, Fessenden, and Sherman in the United States. As a branch

FINBACK—FINDER OF GOODS.

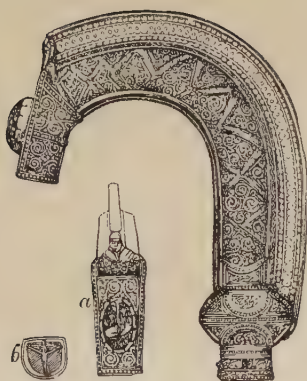
of statesmanship, F. is intimately connected with other branches. In questions of national policy—such as, whether a state can go to war or not—the financier is the person who is expected to count the cost, and say how the necessary funds are to be obtained. In the question, whether an unpopular or oppressive tax is to be abolished, or a desirable tax to be imposed, the financier is an authority on the question, whether the government can do without it, or how, if needful, it shall be imposed. Hence, there is a special connection between F. and taxation, which has become closer and stronger since the progress of political economy has shown that the taxes which are the most productive, and even the most easily collected, are not always the best, looking at the gain or loss of a nation, in the long-run. Turgot said that F. was the art of plucking the fowl without making it cry. On this principle indirect taxation, e.g., as involved in customs duties, has achieved its popularity, since such duties often bring no tangible hardships on any one. Yet, indirect taxes, because of their very indirectness, need careful watching and skillful adjustment to the needs of each case. See further, CUSTOMS: DEBT, NATIONAL: CORN LAWS: EXCISE: FREE TRADE: TAXATION: TARIFF: REVENUE: also, BANK. CURRENCY: MONEY.

FINBACK: see RORQUAL.

FINCH, n. *finch* [AS. *finc*; Dut. *vink*; Ger. *fink*; W. *pine*, a chaffinch (see CHAFFINCH)]: popular name of a great number of species of little birds of the order *Insectores*, tribe *Conirostres*. Many have great powers of song, and are called *Hard-billed Song-birds*, in contradistinction to the Warblers (*Sylviadae*) or *Soft-billed Song-birds*. The name F. is sometimes used as equivalent to *Fringillidae* (q.v.), either in its more extensive or more restricted application; but the limits of its popular use are very indeterminate, and some birds are equally known as finches and linnets, or as grosbeaks, etc. The word F. often forms part of the popular name of birds of this family, as bullfinch, chaffinch, hawfinch, pine-finch, etc.

FIND, v. *find* [Icel. *finna*; Ger. *finden*, to find]: to discover; to recover; to regain something lost; to gain or have; to furnish or supply; to arrive at; to perceive; to determine, as by a verdict: N. discovery; thing found. FIND'ING, imp.: N. that which is found by the jury; a verdict. FOUND, pt. and pp. *found*, did find. FIND'ER, n. one who. FINDING-SHOP, shop where shoemaker's tools are sold. TO FIND IN ONE'S HEART, to be bold enough or hard-hearted enough to do a thing. TO FIND OUT, to discover; to detect. TO FIND FAULT, to censure.

FINDER OF GOODS: one who discovers articles lost by another. The F. acquires a special property in goods which is available to him against all the world except the true owner; but before appropriating them to his own use, he must use every reasonable means to discover the owner. It has been decided that if the property had not been designedly abandoned, and the finder knew who the owner



Fillan, St.—Fig 2. Silver Case of the Quigrich: *a*, Front part; *b*, Terminal plate.



Fig. 1.—Quigrich of St. Fillan.



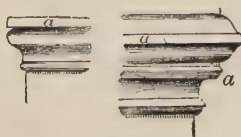
Cone of Douglas Fir (*Abies Douglasii*).



Fimbriate Petals (*Dianthus caryophyllus*).



Fin.—Common Perch (*Perca fluviatilis*): 1 D, First dorsal; 2 D, Second dorsal; P, Pectoral; V, Ventral; A, Anal; C, Caudal.



a, a, a, Fillets.

FINDHORN—FINE.

was, or knew that he could have discovered him, he was guilty of larceny in keeping and appropriating the articles to his own use. In a case in England, in which a person purchased, at public auction, a bureau, in which he afterward discovered, in a secret drawer, a purse containing money, which he appropriated to his own use, Mr. Baron Parke thus laid down the law: 'The old rule, that "if one lose his goods, and another find them, though he convert them *animo furandi* to his own use, it is no larceny," has undergone in more recent times some limitations. One is, that if the finder knows who the owner of the lost chattel is, or if, from any mark upon it, or the circumstances under which it was found, the owner could be reasonably ascertained, then the fraudulent conversion, *animo furandi*, constitutes a larceny.' This law, however, though in most cases clear, is, in some, extremely difficult in application, and judges and juries often go wrong. The question for the jury is not whether they think that the F. could have discovered the owner, but whether he believed that he could; and, if not satisfied as to this, they cannot convict him of larceny. It is a mistake to suppose that the F. is bound in law—though he may well be in honor—to advertise, or use extraordinary means to discover the owner; indeed he cannot claim such expenses from the real owner, if he appear.

FINDHORN, *find'horn*: river rising on the w. side of the Monadh Liadh Mountains, in the e. of Inverness-shire, Scotland. It runs n.e. through the counties of Inverness, Nairn, and Elgin, in the valley of Strathdearn, passes Forres, and enters the Moray Firth at the village of Findhorn by a lagoon three m. by one and a half m. in extent, after a course of about 90 m. Its waters abound in salmon and trout. Its basin consists of gneiss in the upper part, and of old red sandstone in the lower. At one place it rose nearly 50 ft. in the great floods of 1829, Aug., known as the 'Moray Floods,' and did much damage. W. of the mouth of the F. are the Culbin Sands, in one part 118 ft. high, and covering 9,500 acres of a formerly fertile tract.

FINDLAY, *find'lā*: city, cap. Hancock co., O.; on Blanchard's Fork of the Auglaize river; on the Lake Erie and Louisville, and the F. Branch railroads; 31 m. e.n.e. of Lima, 37 m. s.w. of Fremont. F. is the centre of the natural gas region, contains 18 churches, 3 national banks (cap. \$330,000), and one private bank, 3 weekly newspapers, and has extensive glass-works, rolling-mills, nail-factories, machine shops, foundries, flour, oil, and flax mills, and woollen, carriage, spoke, and stave factories. The discovery of natural gas and the opening of gas-wells have given an immense impetus to manufacturing and a sudden growth in population. Pop. (1870) 3,315; (1880) 4,633; (1890) 18,553.

FINE, n. *fīn* [mid. law L. *finis*, applied to the money paid as the price of settlement (see FINANCE)], a sum of money paid as a penalty, as a punishment, or as the price of exemption; a sum of money paid for obtaining a benefit or

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privilege, as for obtaining or renewing a lease: V. to impose a penalty on, in *OE.*, to pay a fine. **FINING**, imp. **FINED**, pp. *fīnd*, subjected to the payment of a sum of money as a penalty or for a privilege. **FINABLE**, a. *fī'nā-bl*, subject to a fine or penalty.—**SYN.** of 'fine, n.': mulct; penalty, forfeit; amercement.

FINE, n. *fīn* [Ger. *fein*; It. *fino*; F. *fin*, slender, clear—from mid. L. *finitus*, finished, perfected—hence, refined, keen; W. *gwyn*, white, fair; Icel. *fina*, to polish, to cleanse: comp. Gael. *fionn*, white, pure]: not coarse; very thin; of small diameter: slender; clear; elegant; beautiful; very handsome; in *OE.*, artful; fraudulent; sly; over-sly cunning, or nice, as 'my fine fellow': V. to clarify; to free from foreign matter; in *OE.*, to decorate; to embellish. **FINING**, imp. refining, purifying: N. the process of refining or purifying (see below). **FINED**, pp. *fīnd*. **FINE'LY**, ad. *-lī*, in a fine manner; beautifully; not coarsely. **FINE'NESS**, n. thinness; clearness; delicacy; purity. **FIN'ER**, n. one who purifies metals. **FIN'ERY**, n. *-nēr-ē*, show; splendor; showy dress or ornaments; a furnace at ironworks for purifying iron. **FINE-DRAWING**, art of sewing up rents with such skill that they are imperceptible; a finishing process with cloth, in which it is subjected to a strong light, while all faulty parts or breaks in the fabric are closed by sound yarn introduced by a needle. **FINING-FORGE**, in *metal.*, open hearth with a blast, by which iron is freed from impurities or foreign matters. Cast-iron is thus rendered malleable. **FINING-POT**, a pot or crucible for refining metals. **FINING-ROLLER**, in *paper-making*, a cylindrical wire-cloth sieve in the paper-making machine, which allows the finely-ground stuff to pass, but restrains the coarse fibres and knots. **FINE-SPOKEN**, using a number of fine phrases. **FINE SPUN**, minute; ingeniously contrived; artfully invented. **FINE ARTS**: see under **ART**.—**FINE-DRAWN**, over minute or nice. *Note*.—Two lines of derivation of **FINE** are given, showing the usual amount of confusion and adaptations. —**SYN.** of 'fine, a.': finished; refined; excellent; superior; showy; subtle; thin; subtle; nice; delicate; exquisite; artful; sly; comminuted; filmy; attenuate; keen; light; delicate; minute; pure.

FINE, *fīn* [L. *fīnis*, an end]: used only in the adverbial phrase **IN FINE**, to conclude; to sum up all: V. in *OE.*, to end. **FINE'LESS**, a. *fīn'lis*, in *OE.*, boundless; endless.

FINE OF LANDS, in England: fictitious proceedings formerly in common use to transfer or secure real property by a mode more efficacious than an ordinary conveyance. A **F.** (so named because it put a termination (*fīnis*) to all litigation between the parties and those claiming through them in regard to all matters touching the suit) was at first an amicable composition between parties; afterward this procedure was generally adopted for conveyance of land. It was abolished by the *Fines and Recoveries Act*, 3 and 4 Will. IV. c. 74. See **CONVEYANCES**; **USES**; **FEMR COVERTE**.

FINERY: see **FINE 2**.

FINESSE—FINGER.

FINESSE, n. *fī-nēs'* [F.—from *fin.* fine, slender—from *fīnītus*, finished, perfect]: artifice; stratagem. **FINES'SING**, a. practicing artifice to accomplish a purpose: N. the practice of artifice.

FINGAL, *fīng'gal*: hero in a collection of poems purporting to have been written by Ossian, son of F., and translated from the ancient Gaelic language by James Macpherson (1762); also title of a separate poem in six books. Macpherson's first work was *Fragments of Ancient Poetry collected in the Highlands of Scotland, and Translated from the Gaelic or Erse Language* (1760). This had such success among scholars that he was urged to continue his literary researches, and published *Fingal, an Ancient Poem in Six Books, together with Several other Poems composed by Ossian, Son of Fingal*, etc. (1762), and *Temora, an Ancient Epic Poem, in Eight Books* (1763). For some time the various poems produced a literary sensation; at length critics began calling on Macpherson for the original Gaelic of Ossian. He declined the requests, and a controversy was opened that lasted 50 years, during which Dr. Johnson gave his opinion that the poems had never existed in any other form 'than that which we have seen.' Subsequently the Highland Soc. of London declared that 'no poems of the kind can be found to exist in the memories of the Highlanders.' The reproduction of the Highland spirit and style is remarkable, giving a certain interest and value to this strange work.

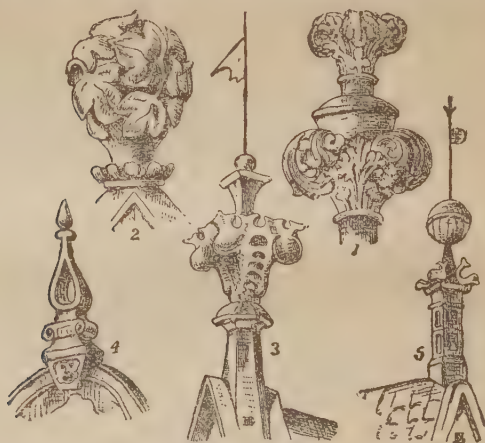
FIN'GAL'S CAVE: see **STAFFA**.

FINGER, n. *fīng'gēr* [Goth. *figgrs*; Dut. *vinger*; Icel. *fīngr*; Ger. *finger*; Fris. *fenger*, a finger: Ger. *fangen*, to seize, to catch]: one of the five divisions of the hand; a measure (see **HAND**). **FINGERER**, one who fingers; a pilferer; a purloiner; a thief: V. to touch lightly; to handle with the fingers. **FIN'GERING**, imp. handling; touching lightly: N. act of touching lightly or handling; manner of touching a musical instrument. **FIN'GERED**, pp. *-gērd*, played on; handled; touched: **ADJ.** having fingers. **FIN-GER-POST**, a post with a painted hand for directing passengers to a road. **FINGER-BOARD**, that part of a stringed musical instrument, as in the violin, violoncello, guitar, etc., which is made of ebony-wood, and glued on the neck of the instrument, and shaped on the top somewhat round, to suit the position in which the strings lie on the nut and the bridge. At the lower end, the finger-board projects over the sounding-board of all those instruments played with the bow, while in the guitar species the finger-board is glued down on both neck and sounding-board. The strings are stretched along the finger-board from the nut at the top to the bridge at the lower end, and are pressed down by the fingers of the left hand, to make the different notes in music; while the right hand produces the sound either by a bow or the points of the fingers. In a piano or organ, the finger-board is the bank or row of keys which are pressed down by the fingers. **FINGER-FERN**, *Asplenium ceterach*. **FINGER-FLOWER**, *digitalis purpurea*. **FINGER-GLASS**, glass

FINIAL.

or bowl in which to rinse the fingers after dinner or dessert. FINGER-GRASS, *Digitaria*, genus of grasses. FINGER-GRIP, tool for recovering rods or tools dropped into a bored shaft. TO HAVE AT ONE'S FINGER-ENDS, to be thoroughly familiar or off hand with. FINGER-AND-TOE, a diseased form of turnip-growth, in which the bulbs are divided into two or more forks: see ANBURY.

FINIAL, n. *fīn'ī-əl* [L. *fīnīs*, an end—from *fīnīrē*, to finish or complete]: ornament, generally carved to resemble foliage, which forms the termination of pinnacles, gables, spires, and other portions of Gothic architecture. There are traces of foliated terminations, both in stone and metal, on the pediments of classic buildings (see ACROTERION), but it was not till the 12th c. that the F. proper was introduced. During the latter part of that c. and the whole of the 13th c. finials of perfect form and of endless variety were used as the crowning ornaments of every salient point in the buildings of the period (see fig. 1). The



Finials:

1, from Bishop Bridport's Monument, Salisbury Cathedral; 2, York Minster; 3, Maulbroun, Germany; 4, Crew Hall, Cheshire; 5, Augsburg.

architects of the 14th c., in finials, as in other ornaments, imitated more closely the forms of natural foliage; but their finials had neither the variety of design nor the vigor of outline of those of the preceding century (see fig. 2). In the 15th and 16th c., the finials became more and more meagre in form, and are frequently only four crockets set upon a bare pyramidal terminal. Some variety of effect is often obtained during this period by surmounting the finial with a gilded vane. This is common in Tudor and domestic architecture (fig. 3). Finials were carved both in stone and in wood, and in the latter material with great delicacy and minuteness. In connection with metal-work, finials of

FINICAL—FINING.

metal were used, and whatever the material adopted, its natural capabilities were made a source of special beauty. —The finial is one of the most effective ornaments of Gothic architecture, and when that style was succeeded by the revival of classic, in the reign of Queen Elizabeth, our forefathers could not persuade themselves to part with the finials to their buildings. We thus find in Elizabethan architecture a great variety of finials; they are, however, almost entirely of geometric form, and without foliage (fig. 4), and are frequently, especially when terminating wooden gables, combinations of finial and vane partly wood and partly iron (fig. 5). In the stricter classic which succeeded the Elizabethan, some traces of the favorite F. remain in the balls, obelisks, etc., used as terminations, and also in the shields and supporters (themselves a remnant of feudalism) which form the crowning ornament of gate-piers, pedestals, etc.

FINICAL, a. *fīn'ī-kāl* [Dut. *fijnkens*, perfectly, neatly; comp. Gael. *fionag*, an animalcule, a mite (see FINE 2)]: affectedly nice or showy; affectedly precise in trifles; effeminate; foppish. **FINICALLY**, ad. *-lī*. **FINICALNESS**, n. **FINIC**, a. *fīn'īk*, or **FINICKING**, a. *fīn'ī-kīng*, and **FINIKIN**, a. *fīn'ī-kin*, affectedly nice; unduly particular; fastidious; fussy; finical.

FINING: process of clearing turbid liquors, such as beer, wine, etc. The simplest mode of F. is by passing the liquor through a porous substance that retains the solids and allows the clear liquid to pass (see FILTER); but this method is applicable only to particles mechanically suspended in a limpid liquid. When the liquid contains mucilaginous or other matter that readily clogs the filter, some other means of F. must be used; as with all malt liquors and most wines when turbid. When in good condition, these do not usually require F. as the suspended matter agglomerates, and sinks to the bottom shortly after the fermentation is completed. When this does not take place, some means of promoting such action are usually adopted. One of the simplest is to add soluble albumen, such as white of egg, to a portion of the liquid, and after beating it well in this, to add the mixture, and stir it into the whole of the liquid. Upon application of heat, the albumen coagulates and contracts from its diffusion into a scum, enveloping and drawing together the suspended matter. The scum is then easily removed. This method is adopted for syrups and other liquids that may be heated without mischief. In making clear soups, the albumen of the meat performs this function. As alcohol coagulates albumen, it may be used for fining wines and cordials without the application of heat. It is generally used for red wines. Malt liquors are usually fined by means of gelatine, either isinglass or cheaper substitutes being used. One pound of isinglass is soaked in three or four pints of water or sour beer, then more sour liquor added as the isinglass swells, until it amounts to about a gallon. The jelly thus formed is next dissolved in seven or eight gallons

FINIS—FINISTERRE.

of the liquor to be fined. This solution, having the consistence of a syrup, is called 'brewers' finings,' and about a pint to a pint and a half is added to a barrel of ale or porter, or to a hogshead of cider or wine. The action of this depends upon the combination of the gelatine with the astringent matter (tannic acid) of the liquor, forming thereby an insoluble solid, which sinks to the bottom, and carries with it, like the coagulating albumen, the suspended matter; but as the flavor of malt liquors depends partly on the astringents that they contain, the F. affects the flavor; the astringents also help to preserve the liquor; hence their removal is in this respect disadvantageous. Malt liquors thus fined do not 'stand well on draught.' The use of gelatine for fining red wines is objectionable, as in most of these the astringent flavor is an esteemed quality; therefore albumen is preferred.

Other methods of F. are adopted. Sugar of lead is sometimes added, and afterward one-half its weight of sulphate of potash dissolved in water. By this means, an insoluble sulphate of lead is precipitated, which in subsiding carries down other matters with it. This is a dangerous process, the salts of lead being poisonous. If properly conducted, the whole of the lead may be precipitated, but a casual mistake in the quantities might cause the death of many people. The method should never be resorted to. Ox-blood is used in the same manner as albumen and isinglass. Lime, alum, alcohol, and acids act by coagulating albumen etc., contained in the liquor. Plaster of Paris, clay, and even sand, are sometimes used to carry down the suspended matters. A strip of isinglass or a piece of dried sole-skin is often used for fining coffee, and it acts in the manner above described. Liquors unusually difficult to fine are called 'stubborn' by coopers and cellarmen.

FINIS, n. *fī'nīs* [L.]: end; conclusion.

FINISH, v. *fīn'ish* [F. *finissant*, finishing—from *finir*, to finish—from L. *finīrē*, to put an end to—from *fīnīs*, an end: It. *finire*]: to put an end to; to complete; to perfect; to come to an end: N. completion; the last touch to a work; that which gives perfection to a work of art; the last coat of plaster on a wall. FIN'ISHING, imp.: ADJ. completing; perfecting: N. completion; perfection; last polish. FIN'ISHED, pp. *-isht*: ADJ. complete; perfect in the highest degree. FIN'ISHER, n. one who puts an end to or completes.—SYN. of 'finish, v.': to close; conclude; terminate; end; accomplish; polish.

FINISTERRE, *fīn-īs-tār'*, or FINISTERE [Lat. *Finis terræ*, 'Land's End']: dept. at the w. extremity of France, comprehending a part of the former duchy of Bretagne (q. v.); 2,648 sq. m. It is traversed from e. to w. by two low but picturesque chains of hills. Its coast is very rugged and broken, its shores bristling with dangerous granite rocks, and fringed with many islands. The soil, one-third of which is occupied by sandy tracts and marshes, is moderately productive; and owing to the vicinity of the

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sea, which washes the n., w., and s. shores of the department, the climate is mild and humid. Corn, hemp, and flax are grown in considerable quantities. In the valleys are smiling meadows. The silver and lead mines of F. are very valuable; those of Poullaouen and Huelgoet being about the richest in France. Its principal rivers are the Aulne, the Elorn, and the Odet. The Aulne is connected by a canal with the Blavet, and forms part of the great line of communication by water from Brest to Nantes. This dept. is divided into five arrondissements: Quimper, Brest, Châteaulin, Morlaix, and Quimperlé. Quimper is the chief town. Pop. of F. (1886) 707,820; (1891) 727,012.

FIN'ISTERRE, CAPE, or LAND'S END: promontory at the n.w. extremity of Spain, lat. 42° 54' n., and long. about 9° 20' w.; the *Promontorium Nerium* of the ancients.

FINITE, a. *fī'nīt* [L. *finītus*, limited, bounded]: bounded; having limits. Fī'NITELESS, a. unlimited. Fī'NITELY, ad. -*ly*. Fī'NITENESS, n. state of being limited; confinement within certain boundaries. *Note*.—INDEFINITE, without bounds. INFINITE, above relations to space.

FINLAND, *fī'n'land* [Fin. *Suomesimaa*, land of lakes and marshes]: a grand duchy of Russia, between 59° and 70° n. lat., and 21° and 33° e. long.; about 750 m. from n. to s., average breadth about 185 m. It is united with Russia, the Emperor of Russia being Grand-Duke of F.; but is administratively independent. The area of F. is estimated at about 145,000 sq. m., of which nearly one-third is occupied by marshes and lakes. The largest of these sheets of water, independently of Lake Ladoga, which belongs partly to the Russian province of Olonetz, are Lakes Puruvesi, Payane, Enara, and Saima; the last of these, about 180 m. in length, constitutes a portion of the system of water-communication which has been established between the central parts of the country and the Gulf of Finland. The lakes are especially numerous in the s.w. of F. where they are almost all united together by rivers and waterfalls, round the central lake of Pyhäjärvi. The surface is a table-land, 400 to 600 ft. above the sea, with occasional higher elevations. There are no mountain ranges; hence the rivers are unimportant; but in the n. the country is intersected by a sandy ridge known as the 'Maanselkæ,' which merges, under the name of the Lapintunturit Mountains, into the great Lappo-Norwegian Alpine chain. The coast-line is generally low, but to the s. is skirted by numerous rocky islands, separated from the land by narrow channels, difficult of navigation, but adapted for defense against hostile attacks from the sea. The principal geological formations are friable granite, hard limestone, and slate. The forests of F. are still very abundant, though they have been recklessly cut down in many parts of the country for the sake of their ashes, which are used to stimulate the soil, whose natural poverty requires to be counteracted by frequent manuring. Pine and fir predomi-

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nate, but birch, beech, oak, etc., thrive in the s. of the country, where is also some good pasture-land. Since the incorporation of F. with Russia, agriculture has declined, and fishing and cattle-breeding increased in importance. The annual exports from F. have a value of about \$25,000,000; the imports nearly reach \$35,000,000. The most valuable are the products of the forests, as timber, pitch, potash, tar, and rosin; for the supply of grain is scarcely larger than the home demand, though at one time F. was regarded as the granary of Sweden for barley and rye. Few fruits ripen except hardy berries; and in the extreme north, vegetation is almost limited to mosses and liverworts. F. yields some copper, iron, lime, and slate, but produces scarcely any salt, which constitutes one of the principal articles of import. Reindeer, wolves, elks, beavers, and various kinds of game abound; while the numerous lakes, and the adjacent gulfs, supply the inhabitants with abundance of salmon, herring, and other fish. The climate is rigorous, and winter, which lasts seven or eight months, is succeeded by a brief spring, which passes almost suddenly into a short but hot summer of six or seven weeks, succeeded in its turn by a rainy season, which ushers in the return of cold weather. In the north, the sun is absent during a part of Dec. and Jan., and almost perpetually above the horizon during the short summer. F. is divided into eight lännes or governments—Nyland, Abo Biorneborg, Tavastehuus, Wiborg, Kuopio, St. Michel, Wasa, Uleaborg, which are included in the three dioceses of Abo, Borgo, and Kuopio, and contain in all 214 parishes. The predominant form of religion is the Lutheran, but the Greek Church has of late years been gaining ground. The courts of law are held at Abo (anc. capital), Wasa and Wiborg; and there is one university, founded 1640 at Abo, but removed to the present capital, Helsingfors, 1829. The highest administrative authority is vested in the imperial senate for F., consisting of 18 members, nominated by the emperor, and presided over by the gov.gen. of Finland. The revenue of F. 1888 was \$8,532,820, expenditure \$7,672,890, debt \$13,982,025, army (peace) 5,400 men with 20,000 reserves, navy none, commercial marine 2,153 vessels, and manufactories 1,750 with 20,000 hands. Pop. (1851) 1,636,915; (1880) 2,028,021; (1887) 2,232,378, of whom 85 per cent. were of the native Finnish race, 12 per cent. Scandinavians, and the remainder Russians, Germans, and Lapps; (1889) est. 2,305,916.

The early history of F. is shrouded in obscurity, and little is known of the people before the 12th c. when Eric the Saint, King of Sweden, exasperated by their piratical inroads, undertook a crusade against them, and compelled them, by force of arms, to profess Christianity. The hold which the Swedes then acquired over the country was never wholly lost till 1809, when Sweden secured peace with Russia by the cession of all F. and the island of Aland; before that time, however, the Russians had at various epochs wrested portion of the Finnish territories from the Swedes, while F. had been for centuries the perpetual cause and scene of wars between the two nations. The Swedish

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language had taken such deep root in F., that the efforts of the Russian government to displace it in favor of the native Finnish have hitherto had only partial success, and in many parts of the country, the people still openly prefer their old masters. The inhabitants, who call themselves *Suomes*, and are denominated *Tschudes* by the Russians, have, however, no affinity of race with the Swedes, and may be regarded as differing from all other European nations, excepting the Lapps and the Finmarkers, to whom they are probably allied. See FINNS: FINNISH LANGUAGE AND LITERATURE.—See further, Rein, *Finlands Historia* (Helsingf. 1871); Hallsten *Finlands Historia och Geografi* (1873); Koskinen, *Finnische Geschichte* (Leip. 1873); Armfelt, *La Finlande* (Helsingf. 1874); Ignatius, *Statistiska Anteckningar om Finland* (1876).

FINLAND, GULF OF: eastern arm of the Baltic Sea, between 22° and 30° e. long., and 59° and 61° n. lat. Its coasts are entirely Russian territory. It receives the waters of the great lakes Onega and Ladoga. The water of the gulf is not deep, and only slightly salt. The topography of the Gulf of F., thoroughly elucidated by Struve, forms an interesting part of the great work of the Russian survey of the Baltic.

FINLAY, *f'in'li*, GEORGE: 1799, Dec. 21—1875, Jan. 25; b. Faversham, Kent, England; of Scottish parents: historian. In 1823 Philhellenism led him to take up his residence in Athens, where he patiently studied the later Greek history. The fruits of his labor and researches are in his *History of Greece under the Romans*, B.C. 146 to A.D. 717 (London 1843; 2d ed. 1857); *History of Greece from its Conquest by the Crusaders to its Conquest by the Turks, and of the Empire of Trebizond, 1204–1461* (London 1851); *History of Byzantine and Greek Empires*, 716–1453 (London, 2 vols. 1853–4); *History of Greece under the Othoman and Venetian Dominion* (1854); and *History of the Greek Revolution* (1861)—all re-edited by H. F. Tozer as *A History of Greece from B.C. 146 to A.D. 1864* (Oxford, 7 vols. 1877). F. threw much new light on modern Greek history. He had profound knowledge also of Greek art, antiquities, and topography. In 1870, he edited Brue's *Journal of Ali Pacha's Campaign in 1715*. He died at Athens.

FINMARK, *f'in'märk*: province of Norway, most northern part of the continent of Europe; between 68° 30' and 71° n. lat., and 17° and 31° e. long., constituting Norwegian Lapland (q.v.); 18,302 sq. m., of which three-fourths are on the continent, the rest on the numerous islands which skirt its n.w. shores, and terminate in the North Cape. Innumerable fiords and bays indent the coast. The interior is intersected by a snow-covered range of mountains, reaching an elevation of 4,000 ft.; the line of perpetual snow being here less than 3,000 ft. above the sea. Agriculture is impracticable above 100 ft.; a few berries are the only fruits that ripen; and though barley, potatoes, and a few other vegetables thrive in some parts, fish and game constitute almost the sole food of the inhabitants. In the north,

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where are no trees the turf of the marshes affords good supply of fuel. The thin vegetable mold which covers the stony soil yields grass for the sheep and cows, which graze on the declivities of the rocks skirting the fiords and creeks. The principal source of wealth is the reindeer in the north, and the cod-fisheries in the south. Hammerfest (q. v.), cap. of F. (70° 40' n. lat.), is the most northern town of Europe. Pop. of F., principally Lapps, a people of Finnish origin (see LAPLAND), in 1880 was 27,000. (1891) 29,110.

FINN, n. *fīn*: a native of Finland. FINNISH, a. *fīn'ish*, pertaining to Finland, its language or its people. FINLANDER, native of Finland.

FINNAC, n. *fīn'nak*: a white trout, a variety of the *Salmo fario*. It is asserted that the fry of this fish have never been seen by the most experienced anglers or salmon-fishers.

FINNED, FINNY: see under FIN.

FINNEY, *fīn'ī*, CHARLES G.: 1792, Aug. 29—1875, Aug. 16; b. Warren, Litchfield co., Conn. He was brought up in Oneida co., N. Y. Having, after a common education, taught school four years, he entered, when 20 years old, a New England high school and, later, learned also some Latin, Greek, and Hebrew. At the age of 26 he began to study law; and turning to the Bible, with special reference to its bearings on legal questions, was led to study it profoundly, and to interpret it as a judge interprets written laws. From the minister whose preaching he attended he heard theological views expressed which he afterwards learned to call very high Calvinism. Whatever he thus received he judged by the Bible, and then debated with his minister freely and earnestly. During this time his interest in personal religion greatly increased. 'If' (he thought), 'there is a future life, I need a change of heart in order to be prepared for it.' Convinced that the Scriptures are the word of God, he accepted Christ as his Savior, renounced the world, and, giving up his cherished legal studies, consecrated his life to the work of preaching the gospel. In connection with this personal experience he received (he says) a 'baptism of the Holy Spirit' which, filling him with overwhelming joy, compelled him to cry unto God that the manifestation might be stayed. Beginning his work in prayer meetings and by personal conversations, he soon became a preacher (1824) and at once found revivals of religion accompanying his ministry. 'The themes of his preaching' (he says) 'were the voluntary, total moral depravity of the unregenerate; the unalterable necessity of a radical change of heart by the Holy Ghost, and by means of the truth; the divinity of the Lord Jesus Christ, his divine mission, perfect life, vicarious death (as an atonement for the sins of all mankind), and his resurrection; repentance, faith, justification by faith, and the doctrines kindred with these. The means used were: simple preaching; much prayer, public and private, as an indispensable condition of promoting the work; conference among Christians; meetings to instruct earnest inquirers;

FINNISH LANGUAGE AND LITERATURE.

and personal conversation.' 'It had been' (he further says) 'the common practice to set anxious persons to praying for a new heart, and to using means for their own conversion. This had produced in them the impression that they were willing to be Christians, and were taking pains to induce God to convert them. But I tried to make them understand that God was using the means with them, and not they with him; that he was ready and they were not; that in praying for a new heart they were trying to throw the responsibility upon God; and their efforts to do duty while they did not give their hearts to him were hypocritical and delusive.' It was under such preaching and personal efforts that those mighty revivals of religion followed which, resulting immediately in the hopeful conversion of thousands, and extending their influences far and wide, formed a striking feature of the half century during which they were continued. Mr. F. visited England 1849 and 58. his preaching in London drew vast crowds and gained a multitude of converts. In 1832 he became pastor of the Second Free Church in New York, and 1834 of the newly organized Congl. Church in that city, known as the Broadway Tabernacle. In 1835 Mr. Finney was chosen prof. of theology and pastor of the church in the college and seminary then founded at Oberlin, O. After 1860, being 68 years old, he gave up his labors abroad, but for 12 years longer, prosecuted with efficiency and zeal his work at home; then, resigning the pastoral office, he continued his seminary duties until his death at Oberlin, at the age of 83 years; 'during 55 of which his life had been a power in the land.' Among his published writings are: *Lectures on Revivals of Religion* (Boston 1835; many editions; enlarged ed. Oberlin 1868); *Lectures to Professing Christians* (Oberlin 1836); *Sermons* (New York 1839); *Lectures on Theology* (Oberlin 1846, new ed. 1878; repub. London); *Memoirs—an Autobiography* (New York 1876).

Mr. F. as a preacher was keen, clear, logical, vigorous, simple, pungent—addressing himself to the conscience. As a 'revivalist,' he urged immediate and public self-commitment to God before the whole assembly. Some attendant incidents of excitements and bodily manifestation, with his strong, sometimes almost overwhelming urgency in statement, called forth much criticism as 'new measures.' His theology also was impugned by some leading minds. Whatever basis there was for such criticism, the fact remains that the practical results of his life-work increasingly commended themselves, and gave testimony to that work as bringing to bear on the public mind a remarkably heightening and spiritualizing force.

FINNISH LANGUAGE AND LITERATURE: an agglutinative language, with an interesting poetic literature. —The Finnish *language*, like that of the other Ugrian nations, belongs to the Turanian family of languages, and hence offers some striking points of resemblance to the languages and dialects of the Turks, Tartars, Mongols, Mandshurians, Tungusians, and even Magyars or Hungarians. In Finnish, the nouns are not inflected, but an addi-

FINNISH LANGUAGE AND LITERATURE.

tional word is required to denote the variations of case, number, and sex. The prepositions and pronouns are suffixed to the words which they modify. The verbs have only two tenses, past and present; the future being expressed by adding to the present some word indicating a future action or state of being. Rask considers the Finnish the most harmonious of tongues. Many Swedish, and a few Russian words have, of course, become incorporated with the language, in consequence of the social and political relations of the F. with those two countries. To Elias Lönnrot of Helsingfors belongs the merit of rescuing from utter oblivion some of the numerous sagas and songs which had for ages been recited by the Finnish *Runolainen*, or singers, to the sound of the *kantela*, or harp, and thus transmitted from one generation to another. Although his researches were limited to the district of Karelia, in the govt. of Kupio, he obtained numerous songs and proverbs, and a complete epos, of 32 parts, each containing 200 to 700-verses. This singular monument of the earlier culture of the people was published by him 1835, under the title of *Kalewala* (anc. name of Finland), but it met little notice till the academy of Dorpat made it the subject of discussion at their meetings 1840, and thus attracted the attention of foreign philologists, and led to its translation into Russian, Swedish, and German. The learned Finnish scholar, Carsten, the Grimms, and Brockhaus, agree in regarding the *Kalewala* as a pure epic, and characterize it as a composition possessing a thoroughly Oriental appreciation of nature, an almost unparalleled wealth of images and tropes, great flexibility of rhythm, and a copiousness of synonyms not known in any other northern tongue. There is less unanimity in regard to the character of the plot, for while one critic believes that the incidents refer to definite historical epochs, another regards them as purely allegorical. But whatever discrepancy of opinion there may be in this respect, the *Kalewala* is admitted by all who are entitled to form a judgment of its merits, to be one of the most curious monuments of the kind possessed by any European people. The date of its composition must be referred to a period anterior to the introduction of Christianity among the Finns in the 14th c., while there is even strong internal evidence, from an identity of the names and traditions of the *Kalewala* with many still current in Esthonia, that the poems very probably belong to an epoch anterior to the immigrations of the Karelians into the districts which they now occupy. The publication of the *Kalewala* has given a powerful impetus to the study of the Finnish language, which the Russian government effectively sustains by encouraging the cultivation and use of their native tongue by the Finlanders. The upper classes still cling to the use of Swedish, but the peasantry and small landed proprietors welcome with avidity every addition to the limited stock of their printed literature. Finnish weekly papers circulate freely among them, and political questions are discussed with an enthusiasm never seen among similar classes in Scandinavia or Russia Proper, but which affords additional proof of the

FINNS.

difference in character of the Finns from either of the neighboring nations with which they have been successively incorporated.

The prose literature of Finland deals almost exclusively with religious and moral subjects. The Bible was translated into Finnish 1642, but a part of the Old Testament had been translated a century earlier. Several Finnish poets have acquired reputation of late years, but their works breathe the same melancholy tone which so strongly characterizes the ancient poems of Finland. Lönnrot has made a collection of about 7,000 proverbs (*Suomen kansan Sanankuja*, 1842), and about 2,000 charades (*Suom. kans. arvoituksia*, 1851). In 1880, about 30 journals or magazines appeared regularly in the Finnish tongue, one of them illustrated. See FINLAND: FINNS.

FINNS, *fīnz*: geographically, inhabitants of Finland; but in ethnology, a considerable branch of the Ugrian race, dwelling for the most part in Finland, though with some representatives in Sweden and Norway also. The Ugrians have been classed among the nations said to have a Mongolian origin. Dr. Latham places them among the 'Turanian Altaic Mongolidæ,' and divides them into Ugrians of the East, and Ugrians of the West. The Western Ugrians consist of Lapps, Finns, Permians, and other nations or tribes in the n. and n.w. of Russia, and of the Magyars in Hungary. The Magyars are the most numerous; and next after these, the Finns numbering abt. 2,000,000. All the other tribes of Western Ugrians together do not comprise as many. The F., in common with the other Ugrians, are of the Mongolian type. A recent traveller, Bayard Taylor, describes them as having 'high cheek-bones, square, strong jaws, full, yet firm lips, low broad foreheads, dark eyes and hair, and a deeper, warmer red on the cheeks than on those of the rosy Swedes. The average height is, perhaps, not quite equal to that of the latter race, Swedes, but in physical vigor, there is no inferiority, and there are among them many men of splendid stature, strength, and proportion.' Other travellers bear similar testimony to the physical appearance of the F. proper, or those of pure Finnish blood; but though these form the majority, there are many, in the towns especially, who pass for F., while in reality, they are quite as much entitled to be called Swedes, or even Russians, on account of the frequent intermarriages of the F. with individuals of those two nations. The F., from having been originally a nomadic race, have for many centuries been stationary and civilized. Long before the arrival of the German and Slavic nations in the north of Europe, the Ugrians, or *Ogres* (for the name so common in fiction is really of historic origin), possessed it, and were gradually pushed further n. and e. by the new invaders. Both F. and Lapps, there is good reason to believe, originally extended much further s. than they do at present, occupying, perhaps, the whole of Sweden and Norway. 'The Finns,' says Prichard, 'were, in the time of Tacitus, as savage as the Lapps; but the former during the succeeding ages became so far civilized as to exchange a nomadic

FINOS—FINSTERWALDE.

life for one of agricultural pursuits; while the Lapps have ever continued to be barbarous nomades, as well as the Siberian tribes of the same race—namely, the Woguls and Ostiaks. The Finns, as well as their brethren the Beormahs, or Finns of the White Sea, had probably undergone this change long before the time when they were visited by Otther, the guest of Alfred. When the Finns were conquered by the Swedes, they had long been a settled people, but one of curious, and singular, and isolated character.'

The F. of our time are doubtless the same race as the *Fenni* of Tacitus, and the *Phinnoi* of Strabo and Ptolemy, though not occupying the same geographical area. 'The nearest approach to a name at once general and native,' says Dr. Latham, 'is Suomalainen, meaning swamp, morass, or fen people; the term Finn and Finlander being of foreign origin.' With respect to the social habits, morals, and manners of the F., all travellers are unanimous in praising them. They are of cheerful disposition, affectionate toward each other, and honest and honorable in their dealings with strangers. 'They are also cleanly in their persons, being much addicted to the use of the vapor-bath, to which circumstance may be attributed the strongly marked difference in physical appearance between them and the stunted Lapps, to whom, in language as well as many other respects, they stand closely related.

FINOS, n. *fīn'ōs* [Sp.]: in *com.*, the second-best wool from merino sheep.

FINS [see FIN]: organs adapted for swimming or locomotion in water. The limits of the application of the term are rather vague. It is always applied to the locomotive organs of fishes, when they possess special organs of locomotion, as almost all of them do; and equally to those organs (the pectoral and ventral fins) which are homologous to the limbs of other vertebrate animals, and to those (the vertical fins) which may be said to be superadded to them and to belong to fishes alone; equally to those also which are furnished with rays, having a membrane stretched on them, as is generally the case in all the fins of fishes, and to those which consist, as in some fishes, of a mere fold of the skin, and which are scarcely organs of locomotion. The name fins is given to the locomotive organs of *Cetacea*, but not to those of any other *Mammalia*, even when, as in the case of the hind feet of seals, they approach very nearly to the character of the fins of fishes. Nor is it ever given to the webbed feet of birds. But it is often given to the swimming organs of invertebrate animals, as to the expansions of the mantle which serve this purpose in the *Cephalopoda*, and which are entirely destitute of rays.

FINSBURY, *fīnz'bér-ī*: or FEN TOWN: parliamentary borough of Middlesex, forming the n. part of London (q. v.).

FIN'SCALE: see RED-EYE.

FINSTERAARHORN, *fīn'stér-âr'hörn*: highest peak of the Bernese Alps: see ALPS.

FINSTERWALDE, *fīn'stér-vâl-dēh*: town of Prussia,

FIONS—FIPPIL.

province of Brandenburg, on an affluent of the Black Elster, 40 m. n. of Dresden. It has manufactures of cloth and machinery: spinning and weaving are carried on. Pop. (1880) 7,300 ; (1885) 7,566.

FIONS, n. *fī'onz* [Gael. *fein*; Ir. *fion*, *fians*]: semi-mythical race of warriors of supernatural size, strength, and daring in the poems of Ossian. According to Skene they were of the race which inhabited Scotland and Ireland before the Scots, and Germany before the Germans. According to others, they were Irish, and derived their name from Fion MacCumhal (Fin MacCoul) their leader: see **FENIAN SOCIETY**.

FIORD, or **FJORD**, n. *fī-ōrd'* or *fyōrd*: in the *Scandinavian tongue*, a name for a bay or inlet of the sea.

FIORENZUOLA, *fē-ō-rēn-zō-ō' lā* (*Florentiola*): town of n. Italy, province of Piacenza, 22 m. w. n. w. from Parma, on the Arda: in a beautiful and fertile plain. It is a station on the railway between Parma and Piacenza, and is also on the ancient Æmilian Way. It is well built, and a place of considerable activity. It formerly had numerous conventual and other ecclesiastical establishments. The principal church is still collegiate, and contains some curious relics of ancient art. There are some interesting relics of mediæval times. It is supposed to occupy the site of the ancient *Fidentia*. Pop. 6,500.

FI'ORIN: see **BENT GRASS**.

FIORITE, n. *fī'ō-rīt* [from *Fiore*, in Tuscany]: pearly-sinter, a siliceous incrustation not uncommon in the vicinity of hot springs and volcanoes.

FIPPIL, v. *fīp'pīl* [etym. doubtful]: to whimper; to whine; to act in an unmanly manner.

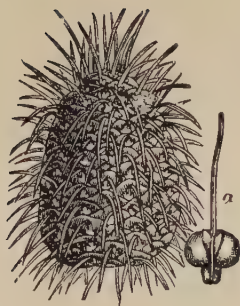
FIR.

FIR, n. *fēr* [Ger. *föhre*; Icel. *fura*; AS. *furh*, *fir*]: a general name for trees having needle-shaped leaves; *Abiēs*, the genus of fir-trees, sub-ord. *Abiētinae*, ord. *Coniferae*; the *Pinus sylvestris*, ord. *Coniferae*. **FIR-APPLE**, a fir cone. **FIR-BOB**, a fir-cone. **FIR-CONE**, the strobilus or cone-like fruit of the fir. **FIR-MOSS**, in bot., *Lycopodium selago*. **FIR-RAPES**, name given by Lindley to the order *Monotropaceae*. **FIR-IN-BOND** name given to lintels, well-plates, bond-timbers, and all timbers built in walls. **FIR-WOOD**, wood of the fir; common deal board.—*Fir* is used often in a sense co-extensive with the widest sense of the word **PINE** (q.v.), and therefore including a large portion of the **CONIFERÆ** (q.v.), or at least the whole of the Linnæan genus *Pinus*.



Common, or Norway Spruce Fir (*Abies excelsa*):
Copied from Selby's *British Forest Trees*.

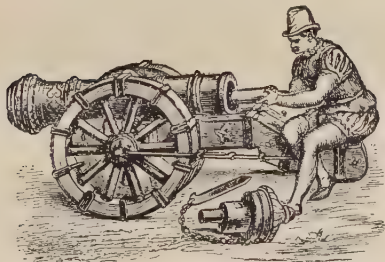
But the name *fir* is used often also in a more restricted signification; and the trees so designated are those forming the genus *Abies* of some authors, *Abies* and *Picea* of others, which the greater number of botanists have now agreed in separating from *Pinus*. For the **SCOTCH-FIR**, however, which is a true Pine (*Pinus sylvestris*), described along with its congeners, see **PINE**. The genus *Abies* is distinguished from *Pinus* by the flat rounded apex of the scales of its cones, and by leaves not in clusters of definite number. Some botanists include the species of **LARCH** (q.v.) and **CEDAR** (q.v.) in the genus *Abies*; but if these be separated, no species with clustered leaves remain in this genus, which then contains only the different kinds of **SPRUCE**.



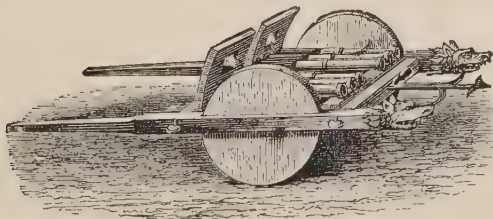
Fir.—Cone of *Abies bracteata*:
a, Scale of cone, showing bract.



Fir. — Branchlet with cones of *Abies Nordmanniana*. At a the scales are supposed to have fallen away, showing the axis.



Firearms.—German Breech-loading Cannon of the Sixteenth Century.



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FIR and of SILVER FIR, or species most nearly allied to those which ordinarily bear these names. All are evergreen. The Spruce Firs form the genus *Abies* of some authors, distinguished by short solitary leaves, scattered all round the branchlets, and by the scales of the (pendulous) cones being attenuated at the apex, and remaining fixed to the axis of the cone. The Silver Firs form the genus *Picea* of some, distinguished by the deciduous scales of the (erect) cones. It being supposed, however, that the Linnæan names had been given through mistake, and that the common silver fir is the true *Abies* of the ancients, and the Norway spruce their *Picea*, Link has attempted, but without being followed by many, to restore these names to their ancient use, and to denominate the genera accordingly.—The NORWAY SPRUCE (*Abies excelsa* or *Pinus Abies*) is a noble tree, sometimes attaining the height of 180 ft. with long cylindrical pendulous cones, denticulate scales, and scattered, green, crowded, suddenly pointed, almost



Cone of Norway Spruce Fir:
a, branchlet and cone; b, scale, with seeds; c, a seed.

quadrangular leaves. It is the *Fichte* of the Germans, called also *Rothtanne* or *Schwarzanne*. Like the other kinds both of spruce and silver fir, it shows the peculiar character of the *Conifere* more perfectly than many of the true Pines do, in its perfectly erect stem, from which proceed almost whorled horizontal branches. It is a very beautiful pyramidal tree, and when old, its long branches droop toward the ground. It forms entire forests in the middle and north of Europe and in Asia, chiefly on elevated ridges, though it prefers moist places. It thrives in districts of primitive rock. In some places, it is found within the Arctic Circle. It is of rapid growth, but is believed to live to the age of 400 years. It yields the same products as the Scotch Fir, resin, turpentine, tar, and lampblack (see these titles); but more resin than turpentine. The true Spruce Rosin flows spontaneously from the bark. The purest pieces are whitish or pale yellow, are sold under the name of Common FRANKINCENSE,

FIR.

and used for ointments and plasters, and when melted yield the common Burgundy Pitch (q v.). The bark of the spruce is a good and cheap non-conductor of heat: the cones are an excellent substitute for tanners' bark. In Sweden and Norway, the inner bark is made into baskets; and the long and slender roots, split and boiled with alkali and sea-salt, are dried, and twisted into cordage, used both for vessels and by farmers. The wood is used for fuel and for house-building; it also supplies masts and spars for ships: it is the WHITE CHRISTIANIA DEAL and DANZIG DEAL of the market, and is very largely exported from Norway and the Baltic. It is whiter, lighter, less resinous, and more elastic than the timber of Scotch Fir. The sap-wood, while still in a gelatinous state, is sweet, and is eaten fresh in Sweden and Lapland: and the inner bark, in times of scarcity, is mixed with a little flour or meal of some kind, and baked into bread. The young shoots still covered with their bud-scales are in many parts of Europe used for fumigation. The leaf-buds are employed medicinally in cases of scurvy, rheumatism, and gout. The pollen is often sold by apothecaries instead of the dust of Club-moss or *Lycopodium*.—A very superior variety of this fir is known as the RED NORWAY SPRUCE. Dwarf varieties are cultivated among ornamental shrubs.—THE BLACK SPRUCE (*Abies nigra*), of which the RED SPRUCE (sometimes called *A. rubra*) is regarded as a mere variety caused by difference of soil, and the WHITE SPRUCE (*A. alba*), form great forests in N. America. The Black Spruce is found as far n. as lat. 65°. Both species are now common in plantations in Britain. Both have quadrangular leaves; those of the Black Spruce are of dark glaucous green, those of the White Spruce are of lighter color. The cones of the Black Spruce are short, ovate-oblong, obtuse, and pendulous, with rounded scales ragged at the edge; those of the White Spruce are oval, tapering to a point with entire scales. The Black Spruce is a valuable timber tree, supplying yards of ships, etc., but its planks are apt to split. The White Spruce is smaller, and the timber inferior. From the Black Spruce the *Essence of Spruce* is obtained, useful as an antiscorbutic in long voyages, and used for making spruce-beer. Spruce-beer is made also by adding molasses or maple sugar to a decoction of the young branchlets, and allowing the whole to ferment. From the fibres of the root of the White Spruce, macerated in water, Canadians prepare the thread with which they sew their birch-bark canoes; and the seams are made water-tight with its resin.—From the twigs of the ORIENTAL FIR (*A. Orientalis*), native of the Levant, a very fine clear resin exudes, known by the name of SAPINDUS' TEARS. This fir has very short quadrangular leaves, densely crowded, and uniformly imbricated.—THE HEMLOCK SPRUCE of N. America (*A. Canadensis*) forms great part of the forests of Canada and of the n. United States, extending northward as far as Hudson's Bay. Its timber is not much esteemed, as it splits very obliquely, and decays rapidly in the atmosphere; but the bark is valued for tanning. The leaves are two-rowed,

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flat, and obtuse. The cones are scarcely longer than the leaves. The young trees have a very graceful appearance, but the older ones are generally much disfigured by remaining stumps of their lower branches.—*A. dumosa* of Nepal is nearly allied to the Hemlock Spruce.—*A. Douglasii* is a noble tree, attaining a height of 250 ft., which forms immense forests in the n.w. of America, lat. 43° to lat. 52°. The bark, when the tree is old, is rugged, and 6—9 inches thick. It abounds in a clear, yellow resin. The timber is heavy, firm, and valuable; the growth very rapid.—*A. Menziesii*, native of n. California, very similar to *A. Douglasii* in general appearance, also produces excellent timber.—*A. Brunoniana*, Himalayan species, forms a stately blunt



Silver Fir (*Picea pectinata*):
Copied from Selby's *British Forest Trees*.

pyramid 120–150 ft. in height, with branches spreading like the cedar, and drooping gracefully on all sides. It is found only at considerable elevations. The wood is not durable, but the bark is very useful.—The KHUTROW or HIMALAYAN SPRUCE (*A. Smithiana*, called also *A. Morinda* and *A. Khutrow*) much resembles the Norway Spruce, but has longer and more pendulous branches. The wood is white, and not highly esteemed, though it readily splits into planks.—The MOUNT ENOS FIR (*A. Cephalonica*), native of Cephalonia, attaining a height of 60 ft., and a diameter of three ft., yields durable and very valuable timber.—The common SILVER FIR (*Picea pectinata*, or *Abies* or

FIR.

Pinus picea) has erect cylindrical cones, 5-6 inches long, and two-rowed leaves, with two white lines upon the under side. It forms considerable forests on the mountains of Central Europe and of N. Asia, and attains a height of 150-180 ft., and an age of 300 years. The wood is white, contains little resin, is very soft and light, and is employed for the ordinary purposes of coopers, turners, and joiners, and in ship and house carpentry, also for making band-boxes and for many fine purposes, especially for the sounding boards of musical instruments. The same resinous and oily products are obtained from the Silver Fir as from the Spruce and Scotch Fir, but of superior quality. It yields the beautiful clear turpentine known as Strasburg Turpentine. Very similar to the Silver Fir, but generally of much smaller size, and indeed seldom much above 30 ft. in height, is the BALM OF GILEAD FIR (*Picea* or *Abies balsamea*), native of N. America from Virginia to Canada. The wood is of little value, but the tree yields CANADA BALSAM (q.v.). Besides these, a number of other species of *Picea* are found in the w. part of N. America and in the Himalaya, some of which are trees of great magnitude, yielding excellent timber, as *P. grandis*, Californian tree 179-200 ft. in



Cone of Silver Fir:
a, branchlet and cones; b, a scale; c, a seed.

height—*P. amabilis*, a species much resembling it—*P. nobilis*, majestic tree, which forms vast forests on the mountains of n. California—*P. bracteata*, Californian species remarkable for its slender stem, which rises to a height of 120 ft., and yet is only about one ft. in diameter at the base—remarkable likewise for the manner in which the middle lobe of each bractea of its cones is produced so as to resemble a leaf—*P. Webbiana*, the HIMALAYAN SILVER FIR, which, in its native regions, fills the upper parts of mountain valleys, and crown summits and ridges at an elevation of more than 10,000 ft., a tree of great size, 35 ft. in girth, and with a trunk rising 40 ft. before it sends out a branch. Other species are *P. Pichta*, native of the Altai Mountains, very nearly resembling the Silver Fir; *P. Nordmanniana*; *P. Fraserii*; etc.—*P. religiosa* is a tall and elegant tree, native of the mountains of Mexico, with slender branches

FIRBOLGS—FIRDUSI.

which are very much used by Mexicans for adorning churches, and with cones shorter than those of any other Silver Fir. *P. Jezensis* is a species introduced of late into western lands, from Japan.

FIRBOLGS: a tribe in the fabulous early history of Ireland, said to have descended from the Nemedians, who, under their leader Nemedius, landed in the island about B.C. 2260; and after 217 years, left it, on account of the oppression to which they were subjected by pirates called the Fomorians. The emigrating Nemedians formed three bands—one went to Thrace, and from them the F. descended; a second to the north of Europe or Lochlan, from whom descended the Tuatha de Danann; and the third to Alban or Scotland, from whom sprang the Britons. The F. returned to Ireland in three tribes, one of which more especially bore the name F., the others were called Fir domnan, and Firgailian. The three tribes, however, were under five leaders, by whom Ireland was divided into five provinces. With Slainge, the first Firbolg king, who began to reign B.C. 1934, and reigned only one year, the Irish historians begin their account of the Irish monarchy and list of kings. The F. were driven out, after they had been 36 years in Ireland, by their kinsmen, the Tuatha de Danann, from Scotland, they having previously passed over to that country from Lochlan; and these, in their turn, were expelled or conquered by the Milesians. The most recent investigators of the early history of Ireland regard the story of the F. as having some basis of truth, but no chronological accuracy; the different tribes having long subsisted in the country together, and with varying fortunes as to temporary superiority. See IRELAND.

FIRDUSI, *fîr-dîsê*, or FIRDOWSI, *fîr-dow'sê* (Tusi), ABU'L-KASIM MANSUR: greatest epic poet of Persia: born between 916-940 A.D. (or between 304 and 328 of the Hedjirah), at Shadab or Rizvan, near Tus in Khorassan; died 1020 (or 411 of the Hedjirah). Whether the name Firdusi (from *firdus*, garden, paradise) was given to him because his father (Fachreddin Ahmad) was a gardener, or on account of the 'Paradise of Poetry' which he had created, is matter of controversy. All that is known of his early life is, that when a boy he was very industrious, and that 'he loved to sit for days alone on the bank of a river.' At the age of between 30 and 40, he went to Gazneh, where Mahmud the Gaznewide resided, great admirer and patron of poetry and the arts. Ere long, F. had an opportunity of displaying both his talent and his extraordinary knowledge of ancient Persian history and legendary lore before the sultan himself, who was so pleased with an episode (the story of Sijavush) written by him at his majesty's order, that he at once paid him a gold dirhem for each couplet, and shortly afterward sent him a great number of fragmentary ancient chronicles and histories of Persia, that he might versify them, and thus carry out the task once attempted by Dakiki—viz., to write a poetical history of the Persian kings from the creation of the world

FIRDUSI.

to the end of the Sassanide dynasty (A.D. 636)—the reward to be a dirhem a line. F. spent 30 years over the work, and produced the famous *Book of Kings* (*Shah Nameh*), consisting of 60,000 double lines. Without going so far as many critics have gone, we may fairly rank it among the greatest epics of all nations: the *Iliad*, the *Mahabharata*, the *Nibelungen*. Truth and fiction, history and fairy lore, all the most gorgeous imagery of the East and its quaintest conceits, together with the homeliest and most touching descriptions of human joy and human sorrow, of valor and of love, the poet has formed into one glowing song. Though abounding—in strict adherence to its sources—in impossibilities and anachronisms (such as Alexander the Great being a Christian, Ki-Khosroo holding the Zend Avesta in his hands—120 years before it was brought to light—Abraham being Zerdusht, etc.), it yet contains not a little of real historical value, quite apart from its being the most faithful mirror of its own times: see *SHAH NAMEH*. But while F. was 'weaving his poetical carpet,' his enemies had not been idle. Unable to attack his genius and his honesty, they attacked his religious opinions; and the sultan, influenced by bigotry and avarice, sent the poet, instead of 60,000 dirhems of gold, so many dirhems of silver. F. was at a public bath when the messenger arrived with the money, and on discovering that it was silver and not gold, that Mahmud had sent him, he divided the amount into three portions, and gave one to the attendant at the bath, another to the messenger, and the third to a man who brought him a glass of sherbet. He then burned several thousand verses which he had written in praise of the sultan, as sequel to the *Shah Nameh*, and composed one of the bitterest satires against him, which he handed over, well sealed, to the king's favorite slave, to give it to him when he might be seized with one of his fits of despondency, as it contained a beautiful panegyric on him. Dreading the sultan's rage, he fled precipitately, first to Tus; persecuted there, he went to Bagdad, where Kadir Billah, the caliph, received him with all honor. But the unrelenting anger of Mahmud followed him thither, and he removed to Tabaristan, which again he had to leave, seeking another refuge. After eleven years of restless wanderings, he was at last allowed to return to his native place, a broken, wretched old man. Mahmud is said to have repented his cruelty at last, and to have sent a caravan loaded with the costliest goods to F., to entreat his forgiveness, and induce him to become once more the star of his court. But while the king's messengers entered one gate of the city, F.'s bier was carried out to his last abode by the other. His only daughter—an only son of his had died long before him at the age of 37 years—refused the sultan's present, and certain buildings were erected instead, in honor of the dead poet.

The great popularity which the *Shah Nameh* has always had in the East, is to a certain amount also the cause of the uncritical state of the texts. Every transcriber shaped and molded certain passages, or even episodes, according

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to his own fancy, so that not two out of the innumerable copies are quite alike. Nor are the 60,000 couplets extant in any one instance, the utmost number, including all the most palpable interpolations, never exceeding 56,600. The first complete edition of the text, with glossary and introduction, was published by Turner Macan (Calcutta, 1829, 4 vols.). Another was published by Mohl (Paris 1838-68, 6 vols.), with a French translation, which latter was re-issued separately 1876-7. F. wrote another poem, *Yusuf and Zuleikha*, which has been edited by Morley, and a *Divan*, or collection of poems. See Miss Zimmern's translation of the *Epic of Kings* (with introduction, 1882); also the works of Hammer, Wahl, Görres, Morley, Ouseley, Atkinson, etc.

FIRE, n. *fîr* [Ger. *feuer*; Icel. *fyri*; Sw. *fyr*; Gr. *pur*, fire: comp. Gael. *faire*, to watch, a watch-fire]: the result of the combustion or burning of bodies, as coal, wood, etc.; a conflagration; severe trial or affliction; flame; lustre; the burning fuel in a grate; anything which inflames the passions; ardor; rage; animation: in *armorial bearings*, denoting those who perform brave actions with ardent courage, their thoughts always aspiring as the fire tends upward: V. to kindle; to set on fire; to take fire; to become irritated; to discharge firearms. **FIRING**, imp.: N. fuel; the setting on fire; discharge of firearms. **FIERY**, **FIERNES**, **FIERILY**: see these titles. **FIRE**, pp. *fîrd*. **FIREARMS**, n. plu. cannon, rifles, etc. (see below). **FIRE-BALL**, meteor resembling a ball of fire passing rapidly through the air; projectiles (see below). **FIRE AWAY**, *familiarly*, go on as quickly as possible. **FIRE-BLAST**, a disease to which the hop-plant is liable. **FIRE-BOTE**, in *English law*, right of a tenant for life or for years, to cut wood on the estate for fuel (See **ESTOVER**). **FIRE-BOX**, in a *locomotive engine*, box in which the fire is placed. **FIREBRAND**, piece of burning wood; an incendiary; one who provokes quarrels. **FIRE-BRICK** (see **BRICK**), and **FIRE-CLAY**, so called from their power of resisting the wasting effects of fire (see **FIRE-CLAY**, below). **FIRE-BRIGADE**, organized body of men for extinguishing conflagrations in towns. **FIRE-DAMP**, inflammable gas, light carburetted hydrogen see **METHANE** issuing from the crevices in mines (see **GAS**). **FIRE-EATER**, one who pretends to eat fire; a fighting character. **FIRE-EATING**, see below. **FIRE-GUARD**, wire fencing in front of a fireplace. **FIRE-IRONS**, the poker, shovel, and tongs. **FIREMAN**, one who tends an engine or assists in putting out fires. **FIREPLACE**, the recess in the wall of a room fitted with a flue, in which a grate for fire may be placed. **FIRE-PLUG**, street water-plug. **FIRE-POLICY**, the authorized document setting forth the nature and extent of the property insured against fire, the sum to be paid under it in the event of fire, and the annual premium payable by insurer (see **INSURANCE**). **FIRE-PROOF**, incombustible (see **FIRE-PROOF BUILDINGS**: **FIRE-PROOFING**). **FIRE-SCREEN**, light movable frame for placing before a fire, partially to intercept its heat or light. **FIRE-SIDE**, one's own home; the domestic hearth. **FIRESTONE**.

FIRE—FIRE ALARM TELEGRAPH.

any stone which stands heat without injury. FIREWORKS, preparations of gunpowder for displays on occasions of rejoicing (see PYROTECHNY). FIRE-WORSHIP, worship of fire practiced by the Parsees (see SUN AND FIRE WORSHIP); for various *superstitions* connected with fire, see BELTEIN: NEED-FIRE. FIRE-WORSHIPPERS: see GUEBERS: PARSEES. GREEK-FIRE, inflammable material that could scarcely be extinguished—used first by the Greeks in the 7th c. ST. ANTHONY'S FIRE, disease called erysipelas (q.v.). CURVED FIRE, from a gun so elevated as to cause the projectile to follow a considerable curve. DIRECT FIRE, from a gun pointed straight at the object fired at. ENFILADE FIRE, from a gun fired in the direction of the length of a parapet or a line of the enemy's soldiers. FLANKING FIRE, from a gun fired nearly parallel to a parapet, or to the front of a body of soldiers. OBLIQUE FIRE, striking the object in a slanting direction. REVERSE FIRE, striking the rear of a parapet or body of soldiers. RICOCHET FIRE, from guns fired with small charges and slight elevations so as to cause a ball to make a series of short bounds. VERTICAL FIRE, from a mortar with a very high elevation in order that the shell may fall more or less vertically or straight downward.—SYN. of 'fire, n.': blaze; ignition; combustion; splendor; brilliancy; zeal; love.

FIRE, ORDEAL BY: see ORDEAL.

FIRE ALARM TELEGRAPH: a system of telegraphy for conveying a designated signal from the locality of a fire to the engine houses of a fire department. Many patents have been issued for systems or parts thereof, and in their details the apparatus used is quite complicated. The system in use in the city of New York illustrates the general features. Throughout the city alarm boxes are established upon street corners. Each box contains an automatic key, which when pulled or moved sends a signal through an ordinary telegraph circuit to a central office. The signal varies for each box, and consists of a series of taps so ordered as to represent a number different for each box: thus . . . meaning 223, etc. When a fire occurs the switch in the nearest box is pulled and the approximate locality of the fire is thus telegraphed to the central office. To avoid error the switch repeats its signal five separate times. In the central office the signal is rung out, and is printed on a strip of paper five times, and a shutter is dropped giving the group or circuit number including the box. From the office two other sets of circuits run to all the engine houses. When the operator receives the first alarm he at once throws one set of these circuits into the alarm circuit. The signal is then automatically sent to all the engine houses in the city. Not only is the number rung, but the same current releases the horses by an electric detent mechanism. Should there be any trouble in thus transmitting the alarm a third series of circuits are provided by which gongs in all the engine houses can be rung by hand from the same central office. The five repetitions of the signal, the printing of the signal on paper, and the two independent alarm circuits provide for every

FIRE AND SWORD—FIRE ARMOR.

contingency or accident that is likely to occur. In some cities the alarm boxes are not locked and are accessible to everyone: it is found that they are not tampered with. In other cities they are locked and keys are distributed throughout the city. Each box contains also an ordinary hand-key so that the officer in charge at a fire can send special signals for assistance to the central office, to be transmitted thence to the engine houses. Each time an alarm is sounded in New York every fireman in the engine houses is awakened and at his station, and every horse is hitched to the engine or other apparatus.

Automatic Fire-detector. A signalling system worked automatically by elevation of temperature is applied to buildings. It may be electrical or mechanical: the first is the favorite. A tube containing mercury may be so arranged that the expansion of the mercury when heated will complete an electric circuit. A number of such tubes with corresponding circuits could be arranged through a building. A bell could then be arranged to be rung on such completion of the circuit. Following these lines numerous variations have been proposed and adopted. Mechanical alarms may sound by the burning of a string, fusing of a fusible alloy, etc., which is made to start a bell-mechanism giving a prolonged alarm.

FIRE AND SWORD, LETTERS OF: in the law of Scotland, anciently directed by the privy council to the sheriff, authorizing him to employ force to bring an accused criminal before the court, or to carry out the decree of a court, when there was resistance. By the modern practice in almost all countries, the judge may, of course, always call in the aid of the military to apprehend an accused party, or to enforce a decree where the ordinary means have proved unavailing.

FIRE ARMOR: protective devices for firemen; in many varieties. The cumbrous nature of the majority has militated against their introduction. In one class a bag or vessel containing pure air is attached to and carried by the fireman. From this vessel a tube is carried so as to communicate with the mouth or nose, giving an independent supply of air. An air-tight helmet may receive the air. In this case the air is inspired through the nose and expired through the mouth. Sometimes no helmet is used, and the end of the air tube is held in the mouth; the wearer breathes in through his mouth and out through his nose. A light valve is adapted to the latter to prevent inhalation of smoke. In a second class of armor, air is supplied from outside the burning building. The armor includes a helmet to which one end of a long hose is attached. The other end of the hose remains outside of the building, and through this hose the fireman's companions force air by means of a bellows or its equivalent. In a third class a filtering medium is depended on to purify the air. The *fireman's respirator* is of this order. It has been found that wet tissues have a wonderfully efficient action in purifying air contaminated with smoke. A mask glazed and fitting tightly over the eyes pro-

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fects them from the irritating effects of such air. The lower part of the mask holds wet sponge firmly in place over the mouth and nostrils: through this the air is inhaled. This simple apparatus has proved wonderfully efficient. For protection of the body, ordinary methods not needing description are used. Apparatus of the first class has been prescribed for use in the New York city fire department, but has been practically abandoned. Armor of the second class has been used in France and the respirator has been adopted quite extensively in the western territories.

FIRE ARMS: implements—usually hollow cylinders, but of whatever form—used in the propulsion of shot, shell, or bullets, to a greater or less distance, by the action of gunpowder or other material exploded by ignition within them. At a more advanced period, an obvious division of the subject into cannon, mortars, and small-arms presents itself; but relative to the infancy of the invention, and amid the obscurity enshrouding it, the natural inquiry is into the origin of F. generally: this includes the invention of gunpowder, since that bears directly on the gradual introduction of F. The widely prevalent notion that gunpowder was the *invention* of Friar Bacon, and that cannon were used first by Edward III. of England, must be discarded. It is certain that gunpowder differed in no conspicuous degree from the *Greek fire* of the Byzantine emperors, nor from the *terrestrial thunder* of China and India, where it had been known for many centuries before its application in modern European warfare.

‘Nitre,’ says Sir George Staunton, ‘is the natural and daily produce of China and India; and there, accordingly, the knowledge of gunpowder seems to be coeval with that of the most distant historic events.’ The earlier Arab historians call saltpetre ‘Chinese snow’ and Chinese salt; and the most ancient records of China itself show that, when they were written, fireworks were well known, several hundred years before the Christian era. From these and other circumstances, it is indubitable that gunpowder was used by the Chinese as an explosive compound in pre-historic times; when they first discovered or applied its power as a propellant, is less easily determined. There is an account of a bamboo tube being used, from which the ‘impetuous dart’ was hurled a distance of 100 ft.: this was at a very early but unascertained period. It is, alleged however, that in the century before the Christian era a cannon was employed, bearing the inscription: ‘I hurl death to the traitor, and extermination to the rebel.’ This must almost necessarily have been of metal. We have also curious evidence in regard to the armament of the Great Wall; for Capt. Parish, who accompanied Lord McCartney’s mission, reported that ‘the soles of the embrasures were pierced with small holes, similar to those used in Europe for the reception of the swivels of wall-pieces. The holes appear to be part of the original construction of the wall, and it seems difficult to assign to them any other purpose than that of resistance to the recoil of fire arms.’ This surmise seemed to carry back the use of gingsals to B.C. 200; but it is now

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known that the great part of the wall dates from A.D. 15th c. Stone mortars, throwing missiles of 12 lbs. to a distance of 300 paces, are particularly mentioned as employed A.D. 757 by Thang's army; and in 1232, it is incontestible that the Chinese besieged in Caifongfou used cannon against their Mongol enemies. Thus, the Chinese must be allowed to have established their claim to an early practical knowledge of gunpowder.

It has been asserted on doubtful grounds, that the principles of F. reached Europe from India, and that India has equal claims with China to the first acquaintance with the art. The ancient Sanscrit writings appear to point plainly to the operation of some primitive sort of cannon, when, in recording the wars of the Egyptian Hercules in India, it is stated that the sages remained unconcerned spectators of the attack on their stronghold, till an assault was attempted, when they repulsed it with whirlwinds and thunders, hurling destruction on the invaders; and a Greek historian of Alexander's campaign testifies that the Hindûs had the means of discharging flames and missiles on their enemies from a distance.

These Indian philosophers seem, from the writings of Ctesias and Ælian, to have possessed also an unquenchable fire similar to that employed later by the Greeks. Passing from these very early times, in which there is reason to believe that some sort of great gun was employed, we come to the comparatively recent date, 1200, when their use is established beyond a doubt, for Chaséd, the Hindu bard, writes (stanza 257) that the culivers and cannons made a loud report when they were fired off, and that the noise of the ball was heard at the distance of about ten coss, which is more than three-quarters of a mile. In 1258, the vizir of the king of Delhi went forth to meet the ambassador of Hulaku, the grandson of Genghis Khan, with 3,000 carriages of fireworks (in the sense of weapons, probably a sort of rude muskets). In 1368, 300 gun-carriages were captured by Muhammed Shah Bahmiani. The use of cannon had so far advanced in India by 1482, that they were even used for naval purposes: shells having been employed two years earlier by the sovereign of Guzerat. In 1500, the Portuguese had matchlockmen to contend with, as well as heavy ordnance. Pigafetta, 1511, found the town of Borneo defended by 62 pieces of cannon mounted on the walls. So much for the antiquity, and apparently common use of firearms in China and India, at times long antecedent to any knowledge of them in Europe, and during the later period at which they were scarcely developed in an effectual degree. Most of the pieces discovered in India, and supposed to be of early manufacture, are composed of parallel iron bars welded together, and very often they had a movable breech-piece. The knowledge of gunpowder and firearms may be presumed to have extended in a westerly direction through the Arabs, whom we find using them possibly in 711, under the name of *manjaniks*, and certainly very early in the 14th c. The Byzantine emperor, Leo, introduced 'fire-tubes' between 890-911, for use in connec-

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tion with Greek fire: and there can be little doubt that these were a species of cannon, probably of small bore. In Spain, both Moors and Christians used artillery as early as the 12th century.

Friar Bacon was conspicuous among his contemporaries for his general learning, and we have no evidence to show whether he discovered the ingredients of gunpowder independently of foreign aid, or whether he derived the knowledge from some ancient manuscripts; the latter, however, seems more likely, as Sir F. Palgrave brought to light in the Bodleian Library a letter from a Spanish friar, Brother Ferrarius, contemporary of Bacon, in which the materials of Greek fire are detailed, differing only in proportions, and in these but slightly, from real gunpowder. That the latter was identified of old with Greek fire, is shown by the name 'Crake,' applied to the first cannon used. This word, which still survives in 'cracker,' is pointed out by Sir F. Palgrave to be nothing more than a Norman corruption of 'Grec.' Bacon's announcement dates from 1216; but the powder of his time, as made in the West, was not readily explosive, since the materials were but roughly cleared of impurities, and then mixed together on a slab; and probably little use could be made of it as a propellant until the process of granulating had been introduced by Bertholdus Schwartz 1320. Immediately after this discovery, cannon of small size appeared in the armory of almost every state, as if their use had been known previously, though no practical effect had been given to the knowledge, on account of the inferiority of the powder manufactured. These cannon generally consisted of a smaller barrel or chamber to receive the charge, which fitted into a larger one containing the projectile (see fig. 1). It may be safely assumed that these weapons, though terrifying from their noise,



Fig. 1.

From the Santini Manuscripts.

were not very harmful—at least to the enemy. In 1326, the Florentine republic ordered the making of iron shot and cannon for the defense of its villages. In 1327, Edward III. used 'crakeys of war' against the Scôts; in 1339, ten cannons were employed in the siege of Cambray.

By 1346, various improvements had been made; and we find in the same year the consuls of Bruges witnessing experiments by one Peter, a tinman, who had constructed a cannon with a square bore, to throw a cubical shot of about eleven pounds; his bolt passed both walls of the town, and unfortunately killed a man on the other side. We have the authority of Villani for believing that Edward III. had three cannon at Crécy; but the cannon then made were, from the little knowledge of casting, limited to about the size of modern duck-guns, and, as has been remarked, three very inferior muskets could have had but little to do with putting 50,000 men to flight.

Till this time, European ordnance had been kept back by the rarity and high prices of sulphur, saltpetre, and iron, the last having been so scarce in England, that it was

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thought necessary to forbid its exportation by a statute of 28 Edward III. Still, crude as was their form, and small their number, firearms had established a firm footing in Christendom; their mission of civilization, and, paradoxical as it may appear, of humanity, had begun. With the first killing discharge, the doom of feudalism had gone forth. Plated armor no longer availed against the weapon of the peasant; and the mailed chivalry, the sinews of previous battles, who had trampled with their iron heels upon popular rights, no longer could carry all before them, but, like other soldiers, were now as loath to be slain by unseen foes as the veriest villain in the host. The people discovered their powers of contending with the noblesse; by degrees, they rose for liberty, and suppressed the tyrannies of the petty lords who had long held them as mere bondsmen. In war, again, as artillery became more general, so the slaughter of battles diminished, for an army outmaneuvered was

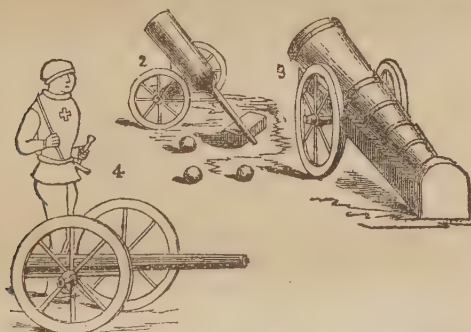


Fig. 2, from the *Chroniques de St. Denis*, Fourteenth Century. Fig. 3, Bombard of the Fifteenth Century, from Froissart. Fig. 4, Cannon of the Fifteenth Century, from *Les Vigiles de Charles VII.*

in army at the enemy's mercy, and therefore beaten; whereas, previously, in the hand-to-hand fights where victors and vanquished mixed pell-mell in single combat, a victory could only be really won when there were no foes left to slay. A battle as great as that at Crécy might now be gained with a loss to the vanquished of not more than 1,000 men, instead of the 30,000 who are said to have fallen victims to the English sword or bow.

Dating from the reign of Edward III., the employment of cannon and bombards in siege operations became general. Froissart records that the Black Prince took bombards, cannon, and Greek fire to the reduction of the castle of Romozantin 1356, but it does not appear that he availed himself of F. at the battle of Poitiers in the same year. The bombards seem to have been short, capacious vessels, from which stone balls were shot with small charges to a short distance, and at considerable elevation; they were essentially the parents of the present bombs or mortars (see fig. 2). The cannon (*canna*, a reed), on the other hand,

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were, for some time at least, of extremely small bore, scarcely larger than muskets of the 18th c.; they discharged leaden bullets, and would have probably been used as hand-weapons, but for their cumbrous and heavy workmanship, which necessitated small carriages. Arms of this description are doubtless those referred to as brought by Richard II. to the siege of St. Malo, to the number of 400 pieces, where they are said to have kept up an incessant fire day and night on the town *without* success.

In the 15th c., armies for siege operations were usually accompanied by great and small guns, the latter being intended to keep down the fire of the besieged while the large bombards were being loaded, an operation requiring no small time. These guns were gradually improved, but it was not until the reign of Henry VIII. that the founders succeeded in casting iron ordnance to the entire exclusion, until quite the present day, of cannon formed of square or rounded bars welded together. England had even then become famous for the workmanship of its ordnance. The accompanying sketch (fig. 5) of a gun found in the wreck of the *Mary Rose*, which sank at Spithead in the above king's



Fig. 5.

reign will show that a degree of excellence had been attained in the manufacture of artillery, little inferior to that which has lasted till our own day when rifled ordnance are rapidly superseding cannon of smooth bores. Still, so late as Henry's reign, though great guns were found very serviceable in siege and naval operations, where the defenses of those days offered but a trifling resistance to their power, they appear to have been looked upon rather as an encumbrance than an advantage with armies in the field. This is attributed partly to the heavy character of the guns themselves, and especially of their carriages, but more particularly to the badness, or rather absence, of the necessary roads for their transport. In 1522, it is recorded in the state papers that the 'kinges ordonauns [were] unable to pass over Stanes More toward Carlile.'

As time passed, the details of the manufacture were improved, the general principles remaining the same; the size of the guns increased, while the proportionate weight of the carriages diminished; limbers (q.v.) were added, and the equipage of a gun gradually perfected and lightened. With increased calibre, to which augmented range was usually added, the number of cannon—at one period enormous—taken with an army was by degrees reduced, until now a certain standard proportion between artillery and infantry is ordinarily maintained. Three guns to a thousand infantry is the proportion now considered best. Of course, this proportion differs with the opinions of various commanders; but the greatest modern generals have always acted on the maxim, that it is wasteful to send a

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soldier on any duty of danger which a ball can be made to perform. As a weapon of offense, Vauban doubled the utility of heavy ordnance when he applied the Ricochet (q.v.) system of firing. Napoleon may almost be said to have won his battles by artillery, for he rarely if ever brought his infantry into action except as supports, until a way had been opened for them, or a panic caused, by the massed fire of large batteries of guns. The Duke of Wellington also devoted the greatest attention to his ordnance train; while, referring to recent events, the campaigns of Lord Clyde in India were remarkable instances of the use of artillery being pushed with abundant success to its greatest limit. During the Franco-German War 1870-1, the Prussians made good use of their numerous breech-loading artillery; and cannon were brought to high efficiency by both armies in the great war of secession in the United States.

Cannon of widely varying bores have at different times been cast, and the various sorts became so numerous in continental armies, as at one time to cause much inconvenience from the large quantities of ammunition which it was necessary to carry. Gustavus Adolphus set the example of reducing his guns to a few standard calibres, and this example was soon followed systematically by the French and other armies. The introduction of rifled guns of late years has limited the classes in use in the British army to the following: *Muzzle-loaders*—17-inch, 100 tons; 16-inch, 80 tons; 12·5-inch, 38 tons; 12-inch, 35 tons; 13·5-inch, 23 tons; 12-inch, 25 tons ('Woolwich Infants'); 11-inch, 25 tons; 10-inch, 18 tons; 9-inch, 12 tons; 8-inch, 9 tons; 7-inch, 7 tons, 6½ tons, and 90 cwt.; 80-pounder of 5 tons; 64-pounder; 40-pounder; 25-pounder; 16-pounder; 9-pounder; 7-pounder (steel) mountain-gun. *Breech-loaders*—7-inch, 64-pounder, 40 pounder, 20-pounder, 12-pounder, 9-pounder, 6-pounder. See CANNON, CARRONADES, GUNNERY, HOWITZER.

The mortar differs from all other guns in its solidity of form, its shortness, and its large bore. The object is the projection of shells by a more or less vertical fire, with the intention of breaking through and destroying, by weight and explosion together, roofs of magazines, public buildings, and so on, or of sinking a shell deep into earthworks of a fortress, in which it shall explode as a most deadly mine. For the different sorts, see MORTAR.

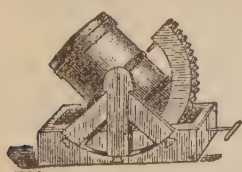


Fig. 6.

From Leonardo da Vinci.

The mortar was developed naturally out of the old bombard, and doubtless deviated by degrees more and more from the cannon. Fig. 6 shows a bombard or mortar designed in the 15th c. In very early days, we read in Arabian authors of a cylinder hewn in the rock at Alexandria, and used as a mortar. Such a cylinder, and of large size, is still to be seen at Gibraltar, where it was employed in the last siege against the

FIREARMS—FIREBALLS.

Spanish, when it was made to discharge volleys of large stones, which spreading at times to a distance of 500 yards, constituted a formidable means of defense. In recent years, nearly all guns fire shells, so that the specific necessity for mortars has greatly diminished.

A gun is a frustrum of a right cone, with a cylinder (bore) removed around the axis; from which it follows that the thickness of metal is greatest at the breech, where it has to withstand the effect of ignited powder in its most condensed, and therefore most powerful state. Guns are cast first in loam or dry sand, then turned to the required shape, lastly bored with the minutest accuracy. Formerly, they were cast with the bore already formed; but the direction was rarely exactly correct, and the surface scarcely ever strictly even. See GUN-FACTORIES, ROYAL: for the science of artillery, GUNNERY. See also ARMSTRONG: LANCASTER GUN: KRUPP'S STEEL.

As to *small-arms*: in the 15th c., the smallest sort of cannon were probably at times mounted and used as hand-guns. From this the step to the arquebus was rapid; that weapon developed as years passed into the clumsy match-lock; that into the firelock and flint-musket; then the percussion-musket; and lastly, into the beautiful rifles of our own day, which have culminated in the central-fire breech-loaders. For diminutives, small arquebuses were made to do duty as horse-pistols; genuine pistols succeeded them; these were gradually improved and reduced in size, till they have culminated in the saloon pistol, available for a waistcoat-pocket, and the deadly revolver. See ARQUEBUS: MATCHLOCK: MUSKET: PISTOL: REVOLVER: RIFLED ARMS: BREECHLOADING GUNS: also LOCK.

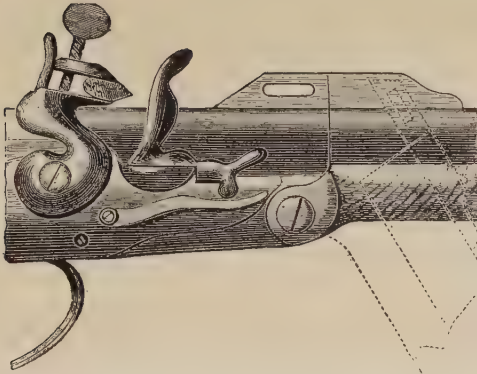
Many valuable works have been written on fire-arms from the days of Leonardo da Vinci and Tartaglia to the present. See Louis Napoleon's *Etudes sur le Passé et l'Avenir de l'Artillerie*; Jervis, *Our Engines of War*; Straish, *Treatise on Artillery*; Chesney, *On Firearms*; Greener, *The Gun and its Development* (1880); and the works of Reinaud and Favé.

FIREARMS, PROVING OF, in Law: required in England, in consequence of the frequency of accidents from the bursting of insufficient barrels. A Royal Charter granted 1637 to the London Gunmakers, gave them powers to search for and prove and mark all manner of hand-guns and pistols. Later statutes rendered the proving of fire-arms compulsory. All have been superseded by 'The Gun-barrel Proof Act, 1868' (31 and 32 Vict.), regulating the duties and powers of the proof-houses in London and Birmingham (the only two in England). The statute does not extend to Scotland or to Ireland, and arms manufactured for her majesty are exempted from its operation.

FIREBALLS: projectiles occasionally discharged from guns or mortars, for the purpose either of setting fire to, or of merely illuminating some work, against which hostile operations are directed. The usual ingredients are—mealed powder, 2; saltpetre, $1\frac{1}{2}$; sulphur, 1; rosin, 1; turpentine,

PLATE 20.

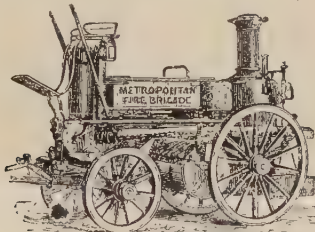
Firearms
Fire-engine



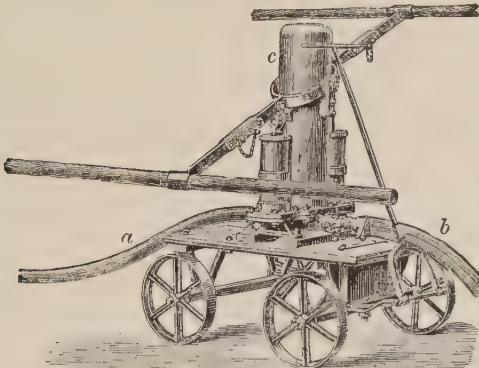
Firearms.—Early Matchlock Gun.



Firearms.—French Flintlock Breech-loader of the Eighteenth Century.



Steam Fire-engine.



Messrs. Shand, Mason & Co.'s Railway Platform Fire-engine: *a*, Supply or suction pipe; *b*, Discharge or delivery hose; *c*, Air-chamber.

FIRECLAY—FIRE-EATING.

2½; with pitch, tow, naphtha, etc., as circumstances dictate. The use of F. has been mostly superseded by the introduction of rockets (q.v.), and incendiary shells (q.v.). Akin to the fireball, was the *fire-arrow* of ancient warfare, which consisted of tow steeped in pitch, rosin, or some inflammable mixture, wrapped round the shaft, and fired alight among an enemy's works or troops. Greek fire also was discharged on large arrows surrounded by tow, and was shot from *balistæ*.

FIRECLAY: variety of clay employed in the construction of gas-retorts, glass-pots, firebricks, crucibles, etc., which require to withstand high temperatures. It is found chiefly in beds in the coal measures; and the more famous kind is from Stourbridge, England. The principal constituents of F. are silica and alumina, accompanied by small proportions of iron, lime, magnesia, water, and organic matter, as is shown in the following table:

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Silica.....	64·10	51·10	48·55	69·25	88·29
Alumina.....	23·15	31·35	30·25	17·90	8·10
Oxide of Iron.....	1·85	4·63	4·06	2·97	1·88
Lime.....		1·46	1·66	1·30	
Magnesia.....	0·95	1·54	1·91		2·99
Organic Matter and Water	10·00	10·47	10·67	7·50	8·64

F. is found abundantly, near and at the surface of the ground, and is readily reduced to powder by travelling wheels. When kneaded with water, and fashioned into vessels and other articles it is dried, and then generally subjected to a strong heat, which drives off the water and organic matter, causes the silica to unite more firmly with the alumina, etc., and leaves a more or less porous material, which can withstand very high temperatures. The Passau crucibles are merely dried, and are not fired like Hessian crucibles and other F. wares. The larger the percentage of silica (sand) in the clay, the more refractory are the articles fashioned from it; and hence sand is often added to clay to increase its fusing point and refractory powers, but a certain proportion of alumina, etc., is required to serve as a flux, to cement and hold together the particles of sand. The proportions of sand and clay are determined by the temperature to which the manufactured article is intended to be exposed; and the F. of crucibles or bricks, which are serviceable at a comparatively low temperature, as in the lining of limekilns, would become soft, and yield in glass or porcelain furnaces.

FIRE-EATING: popular term for a variety of feats performed by jugglers with flaming substances, melted lead, red-hot metal, etc. Evelyn, writing 1672, Oct. 8, thus describes F. in his day: 'I took leave of my Lady Sunderland. She made me stay dinner at Leicester House, and afterward sent for Richardson, the famous fire-eater. He devoured brimstone on glowing coals before us, chewing and swal-

FIRE-EATING.

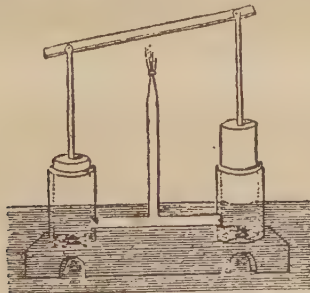
lowing them; he melted a beer-glass, and eat it quite up: then taking a live coal on his tongue, he put on it a raw oyster; the coal was blown on with bellows till it flamed and sparkled in his mouth, and so remained till the oyster gaped, and was quite broiled; then he melted pitch and wax with sulphur, which he drank down as it flamed; I saw it flaming in his mouth a good while; he also took up a thick piece of iron, such as laundresses use to put in their smoothing-boxes, when it was fiery hot, held it between his teeth, then in his hand, and threw it about like a stone; then he stood on a small pot, and bending his body, took a glowing iron with his mouth from between his feet, without touching the pot or ground with his hands; with divers other prodigious feats.' About 1818, Signora Josephine Girardelli, who described herself as the 'original Salamander,' performed astonishing feats of this kind in London and other places in England. According to the accounts of her, 'She commences her performances by passing plates of red-hot iron over her legs; she then stands with her feet naked on a plate of red-hot iron, and afterwards draws the same plate over her hair and across her tongue,' etc. About the same time appeared in Paris M. Chaubert, whose astonishing powers of resisting heat attracted the attention of the National Institute. Among other things performed by this person, was his going into a common baker's oven, with a leg of mutton in his hands, and remaining with the oven closed until the mutton was completely dressed. Another of his performances was standing in a flaming tar-barrel until the whole of it was consumed around him. He subsequently exhibited in London.

Many of the feats of this kind are undoubtedly mere tricks, or illusions, produced by sleight of hand; others are capable of scientific explanation. There is nothing more wonderful in stuffing blazing tow into the mouth—a common form of mountebank fire-eating—than in eating flaming plum-pudding, or in dipping the finger into spirits and letting it burn like a candle. It is well known that the tongue, or the hand dipped in water, may be rubbed with impunity against a white-hot bar of iron; the layer of vapor developed between the hot metal and the skin prevents contact and produces coolness (see SPHEROIDAL CONDITION OF LIQUIDS). Such performances as those of M. Chaubert are explained by the well-known power of the living body to maintain its normal temperature, for a time, independently of the external temperature (see ANIMAL HEAT).

FIRE-ENGINE.

FIRE-ENGINE: machine for throwing a jet of water to extinguish fires. This name was applied formerly to the steam-engine. Machines for the extinguishing of fires have been used from a very early date. They were employed by the Romans, and are referred to by Pliny; but he gives no account of their construction. Apollodorus, architect to Emperor Trajan, speaks of leathern bags, with pipes attached, from which water was projected by squeezing the bags. Hero of Alexandria, in his *Treatise on Pneumatics*—written probably about B.C. 150—proposition 27—describes a machine which he calls ‘the siphons used in conflagrations.’ It consisted of two cylinders and pistons connected by a reciprocating beam, which raises and lowers the pistons alternately, and thus, with the aid of valves opening only toward the jet, projects the water from it, but not in a continuous stream, as the pressure ceases at each alternation of stroke.

The accompanying copy of Hero’s diagram explains itself. Little or nothing is known as to the extent to which engines of this kind were practically used. We have accounts of ‘instruments for fires,’ and ‘water syringes useful for fires,’ in the building accounts of the city of Augsburg, 1518; and in 1657, Caspar Schott describes a fire-engine used in Nuremberg, which must have been almost identical in construction with that described by Hero. It had a water-cistern, was drawn by two horses, was worked by 28 men, and threw a jet of water, an inch in diameter, to a height of 80

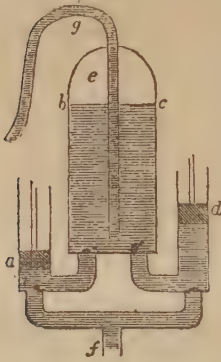


ft. It was not until late in the 17th c. that the air-chamber and hose were added; the first being mentioned by Perrault 1684, and the hose and suction-pipe being invented by Van der Heide 1670. In England, hand-squirts were used till the close of the 16th c. They were of brass, and contained three or four quarts of water. Two men held the handles at the sides, while a third forced up the piston. The nozzle was dipped in a vessel of water after each discharge, then raised, and the water again forced out. So clumsy an apparatus could have been but of little service in the fearful conflagrations to which the old English wood-built towns were subject.

With the addition of the air-chamber and hose, and some improvement in the details of construction, the ‘siphons’

FIRE-ENGINE.

of Hero became the modern fire-engine. The principle of the action of the air-chamber, and of its connection with the pumps, etc., is shown by the aid of the annexed diagram,



where *a* represents in section a piston ascending, *d* the other piston descending, *f* the pipe or hose communicating with the water-supply, *g* the hose that conveys the issuing stream to the fire, *bc* the level of the water in the air-chamber, *e* the space above filled with compressed air. The rising piston raises the water from *f* to fill its cylinder, the descending piston forces the water contained in its cylinder into the bottom of the air-chamber, and thereby compresses the air in *e*. The pistons rise and descend alternately. The compressed air reacts by its elasticity, and pressing upon the surface *bc*, forces the water through the hose

g. In the space *e*, above *bc*, the whole of the air that formerly filled the chamber is supposed to be compressed. Assuming this to be one-third of its original bulk, its pressure will be about 45 lbs. to the square inch, and this pressure will be continuous and nearly steady, if the pumps act with sufficient force and rapidity to keep the water at that level. As air may be compressed to any extent—and its elasticity is increased in exactly the same proportion—the force that may be stored in the compressed air is limited only by the force put upon the pumps, and the strength of the apparatus.

Under proposition 9 of the same work, in which 'the siphons used in conflagrations' are described, Hero describes and figures the air-chamber as 'a hollow globe or other vessel, into which if any liquid be poured, it will be forced aloft spontaneously and with much violence, so as to empty the vessel, though such upward motion is contrary to nature.' The globe is represented with a single piston attached for compressing the air. Thus, about 1,800 years elapsed before proposition 9 and proposition 27 of this work were put together for so obvious and useful a purpose as the fire engine, though the book was known to the mathematicians of the period; and when the two were put together, it was probably done by a practical man, who had never heard of the name of Hero.

The more recently constructed fire-engines include contrivances for preventing the entrance of mud and gravel, and for ready access to the valves in case of their being out of order, while the cistern is dispensed with, a hose being carried directly to the water-supply. They are usually drawn by two or four horses, though smaller engines are made to be drawn by hand or by one horse. The hose in England is usually of leather, fastened by metal rivets, instead of the sewing formerly used. In the United States,

FIRE-ENGINE.

cotton is woven into a tube by machinery constructed for the purpose. Two such tubes are fitted one within the other, and held together by a solution of India-rubber, which, on consolidating, forms a water-tight layer.

The fire-engines of the London Fire Brigade establishment have usually 6-inch barrels with 7-inch stroke, and throw about 70 gallons of water per minute. Their weight, with implements, firemen, and driver, is about 30 cwt. These are found more convenient for general purposes than larger engines, as they can be drawn at a gallop by two horses for a distance under six miles. Four horses are used for greater distances. When a large engine is required, two of these may be joined together, and throw 180 gallons per minute. The pumps are worked by levers, with long horizontal bars attached, to enable a number of men to work together upon the same pumps. Many larger engines than these have been constructed, and steam has been successfully applied. The first application of the steam fire-engine was made when the Argyle Rooms in London were burned 1830. Several floating fire-engines for conflagrations near the Thames have been constructed and worked by steam; one of these is capable of throwing 1,400 gallons per minute. The steam fire-engines have recently been greatly improved, and steam of more than 100 lbs. pressure on the square inch can be raised in seven minutes after making the fire: some of these engines throw a jet to a vertical height of abt. 200 ft., or can drive water horizontally through half a mile of pipe. In the United States all the larger-cities and towns have steam fire-engines, often of great capacity as to volume of water thrown, and great power as to distance. The engines are drawn by horses of superior breed, kept always ready harnessed, and perfectly trained. A stationary boiler in the engine, is often used to keep a supply of steam in the boiler of the fire-engine at a pressure of abt. 50 lbs. The engines now in use are of three kinds—rotary engines; engines having reciprocating pumps with fly-wheels; and the same without fly-wheels.

It has been questioned whether, in cases of very intense combustion, a comparatively small stream of water has any subduing effect at all—some assert that it may even increase the conflagration. Various chemical liquids have been proposed as flame-extinguishers; but plain water is still the only power used to any extent.

FIRE-BRIGADES, or FIRE-DEPARTMENTS.—For working hand fire-engines, a body of *firemen* are required. The London Fire-brigade was formed 1833. The establishment comprises about 550 firemen, 60 stations, 115 manual engines, and 40 steam engines (3 of them floating). The water-supply in London is not so well managed as the engine-supply, thereby-frustrating the exertions of the firemen. At Paris, as on the European continent generally, the fire-engines and firemen are under government control; and the *sapeurs pompiers*, or firemen, are empowered to enforce the assistance of any people they can find in the streets.

In many continental towns, fire-watchmen are stationed

FIRE-ESCAPES.

in commanding situations, such as church-towers; and their duty is to ring a fire-bell, or otherwise give the alarm, immediately upon observing a conflagration. In the United States, the fire-companies in some towns are composed of volunteer firemen, who receive no pay, but certain immunities from taxation and militia service. Their annual parade day is quite a fête. Each company has a special uniform; and in some cities there is much rivalry among them. In other towns, and increasingly in recent years, a paid fire-department is employed by the municipal authorities. Prizes are awarded to companies whose engines throw a jet of water to the greatest height. An admirable system of electro-telegraphy has been adopted, to give notice from station to station in the event of fire. Nevertheless, American conflagrations are often frightfully destructive, as in more recent years, at Chicago 1871, and at Boston 1872, 73.

In Constantinople, there are two fire-towers, one on each side of the Golden Horn, with watchmen continually stationed there. A large wicker-ball is hauled up to the side of the tower as a signal, and the cry of 'There is a fire at Scutari, Tophané,' or whatever be the quarter of the city in which it occurs, is raised and taken up by the patrol, who strike the pavement with their iron-bound staves as they repeat the cry. In a few minutes, the alarm is thus spread throughout the whole city.

FIRE-ESCAPES': apparatus for escape of persons from upper flats or floors of buildings when the lower are on fire. An immense number of contrivances have been proposed; of two distinct kinds—one for affording aid from outside, and the other for enabling those within to effect their own escape. Of the latter, the simplest is a stout cord or small rope, firmly attached to the window-sill of every sleeping-apartment, and coiled up within. A rope one-quarter or three-eighths of an inch thick, and knotted at intervals of about 12 inches, is well adapted for the purpose. A good quarter-inch sash-cord if new will support from three to four cwt. or more. A man with moderate 'nerve' may let himself down by such a cord, either by placing his feet against the wall and bringing 'hand over hand' down upon the knots, or by clinging with his feet and knees to the rope as well as with his hands. A man may let down a woman or child by means of a sack at the end of the rope, or simply by fastening them to the end, and letting the rope pass through his hands, aided if necessary by the friction of the window-sill, if it be allowed to bend over it. A rope coiled upon a drum inside a dressing table, with a winch-handle to uncoil it, is another form. A pulley fixed to the window-sill, over which runs a rope with a chair or simple board to sit on, is another.

In tall houses some means of escape from every sleeping-room should be provided, and the inmates should be thoroughly prepared by knowing beforehand how to act in case of a fire cutting off communication with the stairway. In a row of houses with projecting balconies, a board of sufficient length to reach from the balcony of one house to

FIRE-ESCAPES.

the next may be kept in each room. An exit by the roof or from the window on to the parapet affords a ready means of escape from a top-story, and should always be provided in tall houses. In case of emergency, when no provision has been made, the bedclothes and curtains may be securely tied together to form a rope; or as a last resource, the bedding may be thrown out of window to form a cushion to alight upon in case of the cord or bedclothes being too short to reach the ground. If there be no time to extemporize such cordage, and it should be necessary to drop directly from the window down upon the mattresses previously thrown down, it would be better to hang by the hands from the window-sill and then drop, than to jump direct. In all such cases, self-control is of the utmost importance.

Fire-escapes, to be used from without, consist either of simple ladders kept in some public buildings or other convenient stations, or a series of ladders that can be joined together; of poles with baskets attached; of ropes with weights at one end, that they may be thrown or shot into windows; of combinations of ladders, ropes, bags, baskets, nets, etc. The fire-escape now generally adopted in London by the Soc. for the Protection of Life from Fire is a light carriage or framework on wheels, to which a series of ladders, etc., are attached. It is thus described by the society: 'The main ladder reaches from 30 to 35 ft., and can instantly be applied to most second-floor windows by means of the carriage-lever.' This projects on the opposite side to the ladder like the shafts of an ordinary carriage, and works upon the axle of the wheels as a fulcrum. 'The upper ladder folds over the main ladder, and is raised into position by a rope attached to its lever-irons on either side of the main ladder; or, as recently adopted in one or two of the escapes, by an arrangement of pulleys in lieu of the lever-irons. The short ladder for the first-floors fits in under the carriage, and is of the greatest service. Under the whole length of the main ladder is a canvas trough or bagging made of stout sail-cloth protected by an outer trough of copper-wire net, leaving sufficient room between for the yielding of the canvas in a person's descent. The addition of the copper-wire is a great improvement, as, though not affording an entire protection against the canvas failing, it in most cases avails, and prevents the possibility of any one falling through. The soaking of the canvas in alum and other solutions is also attended to; but this, while preventing its flaming, cannot remove the risk of accident from the fire charring the canvas. The available height of these escapes is about 45 ft.; but some of them carry a short supplementary ladder, which can be readily fixed at the top, and which increases the length to 50 ft.' The society has more than 120 of these fire-escapes stationed in different parts of London. They stand in the roadway, and are each under the charge of a conductor during the night. Almost every house in London is within two or three minutes' run of one of these. Since 1836, when the operations of the society began, they have saved

FIRE EXTINGUISHER—FIREFLY

thousands of lives. At one fire, nine lives were saved by one man and fire-escape. When required, the apparatus is run to the burning house, the main ladder standing nearly upright all the while. It is then directed to the required window at a considerable inclination, and the attendant ascends the ladder, and helps the inmates either to descend by it, or if they are unable to do this, he lets them down by the canvas trough, which forms an inclined plane, along which they may easily and safely descend with the aid he is enabled to afford them.

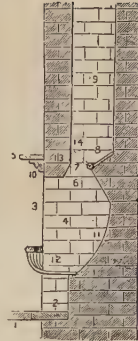
FIRE EXTINGUISHER: apparatus to extinguish fires by pouring on or into them streams of carbonic acid, sulphurous-acid, and other gases which do not support combustion. There are various forms, and their value is chiefly in the earliest stage of a fire, or where air has not free access, i.e. in confined rooms or places in houses. A later invention is a sort of fire hand-grenade, a glass bottle, full of chemical fluid which, when released by the breaking of the bottle, emits dense volumes of gases that stifle the flames.

FIREFLY: name common to all winged luminous insects, at least to all that possess much luminosity. Except the lantern fly (q.v.), they all are coleopterous, and belong to two nearly allied tribes, *Lampyrines*, to which the glowworm (q.v.) also belongs, and *Elaterines*, to which belong the skipjack beetles, and of which the larvæ are well-known to farmers as wireworms. The male glowworm, which alone is winged, has too little luminosity ever to receive the name of F. but the fireflies of



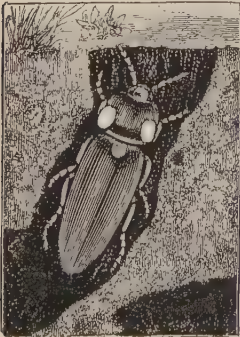
Firefly (*Lampyrus Italica*).

the south of Europe (*Lampyrus Italica*) and of Canada (*L. cerusca*) are nearly allied to it: see GLOWWORM. Fireflies are seen only in the most southern parts of Europe. They abound in almost all the warmer parts of the world, and, in the warm summers in the United States and Canada, presenting a brilliant spectacle when glancing about in numbers amid the darkness of night. The light is yellow and is emitted more frequently while flying. Their flight is slow, and the light is given at regular intervals of two or three seconds. The insect is a little beetle, with soft elytra, of a light brown color, marked with red, and striped; the light proceeds from the last three segments of the abdomen, which are of delicate cream color by day. At night, these three segments are faintly bright at all times. If this part be plucked off and crushed, patches of brilliance appear for a few moments among the flesh, but they gradually die away. They often hover in hundreds over wet and marshy ground, or above a river, or a large field. Still more brilliant are the fireflies of tropical regions, belonging to the tribe *Elaterines*, as the F. of the W. Indies (*Elater noctilucus*), which gives out its light



Section of **Fire-
place:** 1, Slab; 2, Hearth; 3, Jamb; 4, Fireplace; 5, Mantel-
piece; 6, Throat; 7, Gathering; 8, Funnel; 9, Flue; 10, Mantel; 11, Back; 12, Grate; 13, Breast; 14, Damp-
er.

Messrs. Shand, Mason & Co.'s London Fire-escape.



Common **Firefly** (*Pyrophorus noctilucus*) in burrow of mole-cricket, showing the two oval phosphorescent organs in the thorax.

FIRE ISLAND—FIRELESS STEAM ENGINE.

chiefly from two eye-like tubercles on the thorax. The light is so powerful, that small print may be read by it;



Firefly
(*Elater noctilucus*).

and this becomes quite easy if a few of the insects are inclosed in a small glass vessel. They are frequently employed—particularly in San Domingo—to give light for household purposes; and they are used for purposes of decoration on festival days by women, who attach them to their dress or to their hair. One which had been accidentally brought alive to Paris, once astonished and alarmed the Faubourg St. Antoine. These insects are caught in some parts of the W. Indies—a torch being used to attract them—and brought into houses to destroy mosquitoes, which they

eagerly pursue and devour. See LUMINOSITY OF ORGANIC BEINGS.

FIRE ISLAND: strip of wave-made beach 40 m. long, averaging $\frac{1}{2}$ m. wide, off Long Island, between Great South Bay and the Atlantic Ocean; belonging to Suffolk co., N. Y. The beach took its name from the fires built there as signals to vessels during the war with England 1812. Between the beach and the mainland, in Great South Bay, are five small islands; but there is now no F. I. proper. About 45 m. e. of the inlet to the bay the beach joins the mainland. The entire strip forms a popular and well-known watering place, readily reached from Babylon, L. I., extremely salubrious, and with air affording a positive specific for hay fever. There is a large hotel near the Babylon ferry, and within a few rods to the e. a light house 185 ft. high with a revolving light and 8 refractors of French ground glass that alone cost \$17,000.

FIRELESS STEAM ENGINE: locomotive engine, driven by steam produced without a fire on the engine; is for many purposes a desideratum. For street cars especially is it desirable, and the use of electricity for their propulsion is an indicator of this need. By dispensing with a fire the weight of coal and the annoyance of ashes and the services of a stoker all are avoided. The F. S. E. simplest in principle was the invention of Dr. Emile Lamm of New Orleans. The apparatus included a boiler and ordinary steam engine. The boiler was first partly filled with water, and into this steam was injected at high pressure until the temperature rose to 360° or more, and until the pressure was about 150 lbs. to the sq. inch. It is clear that thus a large amount of steam would be converted into water, and at such a high temperature as to be ready for reconversion into steam by reduction of pressure. On opening the throttle-valve the steam would at once enter the cylinder of the engine, and would drive it until the pressure fell to nearly the atmospheric limit, the temperature of the water also decreasing. In this way the highly heated water was made to represent a storage reservoir of

FIRELOCK—FIRE-PROOF BUILDINGS.

steam. In practical working it was found that small engines could run $5\frac{1}{2}$ m. with one charge; recharging required about 2 minutes. The steam pressure ran from 60 to 155 lbs. When it fell to the first named figure the boiler was recharged. Street cars were arranged to be thus driven, a long cylindrical boiler being used. The invention has not been extensively applied. The Carrollton R. R. Co. of New Orleans had ten engines in operation for some time.—The *Soda Engine* of Mr. Honigmann involves the use of strong solution of caustic soda. The boiler contains a compartment, representing the furnace, which contains the soda. It is charged hot. By its sensible heat it soon produces steam, and the engine can be started. The exhaust steam instead of being allowed to escape is carried into the soda chamber. There it parts with its sensible and latent heat, and raises the temperature of the soda lye by combining chemically with it. The solution is so strong that it can thus absorb a large quantity of water and develop from the combination a great increase of temperature. Approximately the temperature attained is equal to that of the boiling point of the soda solution. For street car propulsion, for work in mines, and in submarine torpedo-boats, where economy of air is necessary, or where it is desirable not to contaminate the atmosphere, these engines find their uses.

FIRELOCK: name applied to the old musket, when introduced 1690, which produced fire by the concussion of flint and steel; distinguished from the *matchlock* previously in use, which had been fired by the insertion of a lighted match at the powder pan. Writers of the earlier part of the 18th c. called firelocks 'asnaphans; a word obviously corrupted from the Dutch *snaphaan*, and leading to the inference that they were brought to England by William III. and his Dutch auxiliaries. Their invention is, however, involved in obscurity. The weapon was superseded before 1830 by the percussion musket; which, in its turn, has now yielded to the rifle. (q.v.).

FIRENZUOLA, fē-rēn-zō-ō'lá, ANGELO: 1493—prob. 1542, 3, or 4; b. Florence: author. After studying law at Florence and Perugia, he went to Rome, anticipating a brilliant legal career, but shortly abandoned the eternal city, disappointed in hope and shattered in health. He seems finally to have enrolled himself among the monkish brotherhood of Val-lombrosa, and to have gained influence, in spite of his extreme license of morals, and of writing. His chief works are a spirited paraphrase of the *Golden Ass of Apuleius*—considered by his countrymen to excel the original in nerve and beauty of language; *I Discorsi degli Animalì*—containing political lessons as uttered by his animal orators; *I Ragionamenti*, in close imitation of the *Decameron* in impurity of sentiment, and classic purity of language; *Il Trattato della bellezza delle donne*, eulogium of woman. The best edition of his works is that of Florence (1763, 3 vols.).

FIRE-PROOF BUILDINGS: structures able to resist fire. The problem of constructing buildings proof against

FIRE-PROOF BUILDINGS.

all risk of conflagration, has not yet been solved; as the liability though greatly diminished is not entirely averted. Precautions against fire must not be neglected in even a 'fire-proof' building. The most destructive fire in London since 1666 was that at Cotton's Wharf, 1861, the warehouses of which were called 'fire-proof.' The great fury of this conflagration was due to the nature of the goods that were stored—especially saltpetre, which though itself incombustible, intensifies immensely the combustion of other substances.

The nearest approximation to fire-proof construction may be obtained as follows: the walls should be of stone or brick, and any ties, lintels, etc., required in the construction should be of iron. The staircases should be of iron or stone, and the floors or landings of tiles, concrete, or stone. Wherever wood is inevitably used, it should be prepared with silicate of soda (see FIRE-PROOFING). Instead of wooden joists to support the floors of each story, arched stone or brickwork should be used, and this should be put together with sufficient care to be independent of the mortar. The roof should be constructed in like manner, wooden rafters being excluded. The doors should be of iron, and the security would be much increased if the doors between any two apartments containing combustible materials were double, with a space between them equal to the thickness of the walls. Of course, it is not practicable to carry out all these precautions in a dwelling-house, but the danger from fire may be considerably diminished by attending to some of them. Wooden staircases especially are dangerous. The most important conditions for a warehouse are, that each apartment shall be separated from the next by stout walls of non-conducting materials, and especially that each shall be as nearly as possible air-tight; and whenever, from the nature of the goods, ventilation is required, it should be obtained by periodically opening the doors and windows. If this latter condition is fulfilled, any fire would extinguish itself, unless there be with the combustible goods some oxygen-giving substance, such as saltpetre, chlorate of potass, or other nitrates or chlorates.

At first sight, it seems that a warehouse built entirely of iron, would be effectually fire-proof, but this is far from being the case. In the first place, iron conducts heat more readily than any other material used in building; secondly, cast-iron is liable to crack and split when suddenly heated or cooled. Iron supports may, under some circumstances, be even more objectionable than wood, for if the water from a fire-engine were to play upon a heated cast-iron girder, it would probably give way immediately, while a stout wooden beam might be extinguished before being burned through. When buildings supported by iron girders are burning, they are far more dangerous to firemen than those with wood, as iron girders split and fall without visible notice. It is on this account that floors of arched masonry are recommended. In great fires, the heat is sufficient to fuse iron. In the great Chicago and Boston conflagrations, it was found that the solid granite-brick, and

FIRE-PROOFING—FIRE-RAISING.

iron, disintegrated and crumbled in the intense heat, and were no hindrance to the progress of the flames.

Without going to the expense of making warehouses, and manufactories 'fire-proof,' certain precautions not of a costly nature might be adopted, for merely checking the conflagration until the arrival of fire-engines. Among these simple measures, are iron doors hinged on stone between different departments; a sufficient deafening not easily destructible between the ceiling of one story and the floor of that above; and stone stairs. For rendering timber difficult of combustion, see FIRE-PROOFING.—See also SAFES.

FIRE-PROOFING: art of rendering substances incombustible. Attempts have continually been made to render cotton, linen, and other textile fabrics, timber, etc., incombustible; but thus far with only partial success. There are many means by which fabrics may be prevented from flaming, their combustion being reduced to a slow smouldering. By moistening the fabric with a solution of any saline substance, which, upon drying will leave minute crystals deposited in or between the fibres, its inflammability will be greatly diminished, but the salt imparts a degree of harshness to the fabric, and in many cases weakens the fibres. Alum, sulphate of zinc, and sulphate of soda have been used, and are effectual to prevent flaming, but they weaken the fibre. Common salt does the same. Phosphate and sulphate of ammonia are less objectionable on this account, but the former decomposes by contact with the hot iron in ironing. Tungstate of soda has been proposed, and is said to have no injurious effect on the fibre. Sulphate of ammonia, chloride of ammonium (sal ammoniac), and borax, are among the best fitted for domestic use, though not unobjectionable. For made-up clothing, borax is, perhaps, the best, as it is most effectual in its action, and least injurious to the appearance of the article, though it is stated to have some weakening effect on the fibre in case of a tearing strain. Wood has been treated with milk of lime, alum, sal ammoniac, sulphate of ammonia, chloride and sulphate of zinc, sulphuret of lime and baryta, etc., its *inflammability*, but not its *combustibility*, is thus destroyed. Like the fabrics, when similarly treated, wood smoulders slowly. The most efficient protection to wood is silicate of soda. If planks of moderate thickness be brushed three or four times over, on each side with a strong solution, they are rendered almost incombustible; they will burn only when very intensely heated. The silicate fuses and forms a glass which envelops the surface and even the internal fibres if the wood be sufficiently saturated, and thus seals it from the oxygen of the air.

FIRE-PROOF SAFES: see SAFES.

FIRE-RAISING, in the Law of Scotland: equivalent term for arson (q.v.). Attempting to set fire to houses, crops, etc., is a distinct crime from arson (q.v.), or the actual destruction of property by fire. The attempt to burn growing crops of grain, etc., is a felony. These offenses

FIRE-SHIP.

are also misdemeanors at common law. Inciting others to commit fire-raising is an indictable offense; and, in some old cases, persons have been punished for the mere threats to commit the offense, without being guilty of any overt act.

The *English Act* 9 and 10 Vict. c. 25, declares that whoever shall maliciously, by the explosion of gunpowder or other explosive substance, destroy or damage any dwelling-house in which there is any person at the time, is guilty of felony. Blowing up a building with intent to murder, and thereby endangering life, or casting upon any person any explosive or corrosive fluid whereby grievous bodily harm is occasioned him, and similar offenses, are declared to be felony. Attempting any of these offenses subjects the perpetrator to a minor punishment. The manufacturing or having in possession any explosive substance, or dangerous or noxious thing, or any machine or instrument, for the purpose of committing any of the above offenses, is a misdemeanor.

FIRE-SHIP: vessel, usually old, filled with combustibles, sent in among a hostile squadron, and there fired, in the hope of destroying some of the ships, or at least of producing great confusion. Livy mentions the use of fire-ships by the Rhodians, B.C. 190; but among the first occasions in modern times when they are known to have been employed, were by the Dutch in the Scheldt during



Fire-ship.

the War of Independence in the Netherlands, and, shortly afterward, by the English, 1588, against the Spanish Armada. The Chinese tried them against the British fleet before Canton 1857, unsuccessfully. The service of nav-

FIRISHTA—FIRM.

igating one of these ships into the midst of an enemy, there firing it, and then attempting to escape, is always fraught with great risk of failure and disaster.

FIRISHTA, MOHAMMAD KASIM HINDU SHAH: Persian historian: b. toward the end of the 16th c. (1570?) at Astrabad, on the Caspian Sea; d. (probably) soon after 1612. At a very early age, he went with his father (Gholam Ali Hindu Shah) to India, and when 12 years old, was at Ahmednuggur, in the Deccan, sharing the instruction which his father gave to Prince Miran Hussein Nizam Shah. He afterward became capt. in the body-guard of Murteza Nizam Shah; and when this king was deposed by his own son, F.'s former fellow-student—who, in his own turn, was deposed and murdered in less than a twelvemonth afterward—F. went to Bijapore (1589), where Ibrahim Adil Shah II., the reigning monarch, received him with great honor. F. soon after his arrival, took part in an action against Jumal Khan, in which he was wounded and taken prisoner, but soon escaped. His great work is the *Tarikhi Firishtha*, or History of the Mohammedan Power in India, which he finished 1609. 20 years were spent in its preparation, and the number of books used for, and partly embodied in it—special histories of certain periods and provinces—amounts, according to F. himself (Introduction), to 35; but 20 others are quoted in the work. It consists—besides a preamble or introduction on the Progress of Mohammedanism in India, and a final treatise on the geography and the climate of India—of 12 divisions, treating of the kings of Ghinzi and Lahore, Delhi, the Deccan, Guzerat, Malwah, Candeish, Bengal and Behar, Mooltan, Sind, Cashmere, Malabar, and of the saints of India. Written with an impartiality, simplicity, and clearness rare in an Eastern work, this history has become a standard work on the subject, into which it was the first to enter at length. Single portions have been translated by Dow, Scott, Stewart, Anderson, etc.; but the whole work, edited first by J. Briggs (Bombay 1831, fol. 2 vols.), was also translated by him (London 1832, 8vo, 4 vols.). A fuller account of F.'s life and writings, by the same author, is in Transactions of the Asiatic Society, vol. II.

FIRKIN, n. *fēr'kīn* [Dut. *vier*, four, and old Dut. *kin* for *ken*, little]: old measure of capacity containing nine gallons (old ale and beer measure). But previous to 1803 it had two values, being estimated at eight gallons in old ale measure, and at nine in old beer measure. The firkin is equivalent to $9\frac{1}{4}$ imperial gallons: see GALLON. The word is applied also to a small barrel or covered tub used for butter, etc.

FIRLOT, n. *fēr'lōt* [AS. *feortha*, the fourth, *hlōt*, a portion]: old Scotch dry measure, of which there were four in a Boll (q.v.). Though differing in value for different substances and places, its relation to the boll remained invariable: see PECK.

FIRM, a. *fērm* [F. *ferme*—from L. *firmus*, steadfast, strong; It. *fermo*]: closely compressed; hard; solid; con-

FIRMAMENT—FIRMAN.

stant; steady; resolute: N. the name or title under which a company transacts business; a partnership (q.v.): V. in *OE.*, to confirm; to establish; to fix steadily. **FIRM'LY**, ad. -*li*. **FIRM'NESS**, n. stability; steadfastness; constancy; hardness. **FIRM'ITUDE**, n. -*ī-tūd*, in *OE.*, the state of being firm; firmness; strength.—**SYN.** of 'firm, a.': fast; fixed; unshaken; compact; dense, stable; stanch; robust; strong; certain; steadfast.

FIRMAMENT, n. *fēr'mă-měnt* [*F. firmament*—from *L. firmamen'tum*, a support, a prop—from *firmus*, firm: *It. firmamento*]: word in use of old to signify the seeming vault of heaven; the sky; an expanse or wide extent. **FIR'MA-MEN'TAL**, a -*měn'tăl*, pertaining to the firmament.—The word *Firmament* found its way into English from the Vulgate, which renders the Septuagint *Stereoma* and the Hebrew *Rakia*, by the Latin *Firmamentum* (Gen. i. 6). *Rakia* (from the verb *raka*, to beat or strike out) signifies whatever is expanded or stretched out, and was specially employed by the Hebrews to denote the hemisphere above the earth, compared (Ex. xxiv. 10) to a splendid and pellucid sapphire. Elsewhere (Ez. i. 22-26) it is spoken of as the 'floor' on which the throne of the Most High is placed. Hence it follows that the notions of solidity and expansion were both contained in the Hebrew conception of the firmament. The blue ethereal sky was regarded as a solid crystal sphere, to which the stars were fixed (compare the *cælo affixa sidera* of Pliny, ii. 39, and xviii. 57) and which was constantly revolving, carrying them with it. This sphere or firmament divided 'the waters which were under the firmament from the waters which were above the firmament,' and the theory of the phenomena of rain, etc., was that there were 'windows in heaven'—i.e., in the firmament, through which, when opened, the waters that were above the firmament descended. 'The same day were all the fountains of the great deep broken up, and the windows of heaven were opened,' Gen. vii. 11. The notion of Greeks, and other early nations, was essentially the same. In the progress of astronomical observations, it was found that many of the heavenly bodies had independent motions, inconsistent with the notion of their being fixed to one sphere or firmament. Then the crystalline spheres were indefinitely increased in number, each body that was clearly independent of the rest having a sphere assigned to it, till a complex system was introduced, capable of being fully understood only by the philosophers who formed it: see **PTOLEMAIC SYSTEM**. It was long before men formed the idea of the possibility of a body being maintained in motion in space without a fixed support, and considering the number of phenomena of which the hypothesis of a crystalline firmament offered an apparent explanation, we must regard it as having been in its day a curious and ingenious speculation.

FIRMAN, n. *fēr'măn* [*Turk. firmaın*; *Pers. farman*, a mandate, order]: word used by the Turks to denote any official decree emanating from the Ottoman Porte. The

FIRMINY—FIRST.

right of signing any F. relating to affairs connected with his special department is exercised by every minister and member of the divan, but the office of placing at the head of the F. the *thogrā*—a cipher containing the name of the sultan in interlaced letters, and which alone gives effect to the decree—is committed to the hands of a special minister, who is called *nichandji-effendi*. The name applied to such decrees as have been signed by the sultan himself is *hatti-sherif*. The name F. may signify also a more formal kind of Turkish passport, granted only by the sultan or by a pasha.—A written permission to trade is called in India a *firman*.

FIRMINY, *fēr-mē-nē'*: town of France, dept. of Loire, six m. s.w. from St. Etienne, with which it is connected by a branch railway. Near it are rich coal-mines. It is a place of much activity, and has manufactures of silk, glass, and hardwares. Ribbons and nails are among the articles most largely produced. Much lamp-black also is made. Pop. (1881) 12,183; (1891) 14,502.

FIRN, n. *fēr-n* [Swiss]: name for the slightly compacted snow of the higher Alps, see **NÉVÉ**.

FIROLA, *fīr-o-lā*: genus of gasteropodous mollusks, of the order *Heteropoda*, entirely destitute of shell—though there is a small branchial shell in the nearly allied genus *Carinaria*; of a very elongated form, having the mouth at the extremity of a proboscis; tentacula wanting, or merely rudimentary; and generally remarkable for great transparency of substance, often enlivened with golden spots. They swim by means of the *foot*, which is compressed into a fin, are often seen at the surface of the water in calm



Firola Frederici.

weather, and are abundant in the warmer temperate and tropical seas. The oxygenation of the blood is supposed to take place in part through the delicate tissues, as there are no special breathing organs but a ciliated band.

FIROZPUR: see **FEROZE PORE**.

FIRST, a. *first* [Icel. *fyrir*, before; *fyrstr*, in front of all; L. *primus*, first]: earliest in time; foremost; chief; principal; primary; the ordinal of *one*: AD. before anything else. **FIRSTLING**, n. the first-born of beasts; in *OE.*, a thing first thought of or done. **FIRSTLY**, ad. *-lī*. **FIRST-RATE**, of highest excellence; of the greatest size, as a man-of-war. **FIRST FLOOR**, in the *United States*, the ground-floor; in *England*, that above the ground-floor. **FIRST FRUITS**, the earliest mature fruits or produce of the earth; the first profits; first or earliest effects or results, used in a

FIRST-BORN.

good or bad sense. AT FIRST, at the beginning. FIRST-HAND, directly; immediately; new, as opposed to second-hand. FIRST INTENTION, the healing up of a cut or wound without suppuration. FIRST AND LAST, throughout; on an average. FIRST OR LAST, at one time or other. FIRST-FIT, *n. fit*, or FIRST FOOT [*Scot. fit*, foot, person]: in *Scot.*, the person who first enters a dwelling from without on the first day of the year.—*SYN.* of 'first, a.': original; primitive; primæval; pristine; highest; primordial; earliest.

FIRST-BORN [*Heb. Bekor*, *Gr. prototokos*, *Lat. primo genitus*]: in scriptural use, the first male offspring, whether of man or of animals. By a principle of the Mosaic law, indeed of the common law of nature, it was established that the firstlings of all the produce of creatures, whether animate or inanimate, were in some sense due to the Creator as a recognition of His supreme dominion: see FIRST-FRUIT. Under the title arising from this recognition are to be classed many observances regarding the F. B. of animate beings rational or irrational, which prevailed among eastern nations generally, or which are specially established by the Mosaic law.—1. The F. B. male, whether of men or of animals, was devoted from the time of birth to God. In the case of F. B. male children, the law required that, within one month after birth, they should be redeemed by an offering not exceeding in value five shekels of silver (*Ex. xiii. 13*). If the child died before the expiration of 30 days, the obligation of redemption ceased; but if that term were completed, the obligation was not extinguished by the subsequent death of the infant. This redemption took place according to a fixed ceremonial. The F. B. male of animals also, clean or unclean, was equally regarded as devoted to God. The F. B. of clean animals, if free from blemish, was to be delivered to the priests within 12 months after birth, to be sacrificed to the Lord (*Deut. xv. 21*); nor was it permitted to any but the priests to partake of the flesh of such victims (*Num. xviii. 18*). If the animal were blemished, it was not to be sacrificed, but to be eaten at home (*Deut. xv. 22*). The F. B. of unclean animals, not being a fit subject for sacrifice, was either to be put to death, or to be redeemed with the addition of one-fifth of its value (*Lev. xxvii. 27*; *Num. xviii. 15*). If not redeemed, it was to be sold, and the price given to the priests.—2. Primogeniture, both by the patriarchal and by the Mosaic law, had certain privileges attached to it, the chief of which were the headship of the family, and a double portion of the inheritance. Before the time of Moses, however, it was in the power of the father to decide which among all his sons should be considered the first-born. Moses ordained that the right should invariably belong to the F. B. in point of time.

Among other nations considerable variety existed as to the succession of children to the inheritance of their parent. The Greeks, especially the Athenians, excluded the females of a family so rigorously from the inheritance, that in the event of a father dying intestate and without heirs-male of his body, the nearest male kinsman succeeded

FIRST-FRUITS.

to the estate. The later Romans, on the contrary, placed daughters on the same footing with sons as to the division of intestate property. The Mohammedans gave the daughters a certain share of the father's estate, but only one-half of that assigned to the sons. All the nations of Germanic descent restricted the succession, especially in land, to heirs-male. But the Visigoths in Spain admitted females, except in certain contingencies.

For the rights of the F. B. in English and Scotch law, see SUCCESSION: PRIMOGENITURE: ETC. In France, the law of primogeniture fell at the Revolution, in common with many other relics of the feudal system. How far the results of the change have been beneficial, is still a question among political economists. In Virginia, after the revolution, a similar change took place; and that the change has been in accordance with public opinion in that state may be inferred from the fact, that a parent now usually makes, by will, the same disposition of his property as that which would be provided by the law itself in the case of his dying intestate.

FIRST-FRUITS [Heb. *reshith*, Gr. *protogennemata* and *aparchai*, Lat. *primitiæ*]: that portion of the fruits of the earth and other natural produce, which, by the usage of the Jews and other ancient nations, was offered to God, as an acknowledgment of His supreme dominion and a thanksgiving for His bounty. Among the Jews, the institution of first-fruits comprised both public and private offerings. Of the former class, there were three principal offerings: the first was at the opening of the grain harvest. On the day after the Passover Sabbath, 16th of the month Nisan, a sheaf of new grain, cut and gathered with much solemnity, was carried to the Holy Place, and there waved before the altar (Lev. xxiii. 5, and foll.); nor was it permitted to commence the harvest-work till after this solemn acknowledgment of the gift of fruitfulness. Again, at the Feast of Pentecost, two loaves of leaven bread, made from the flour of the new harvest, were waved, with a similar form of worship, before the altar (Ex. xxxiv. 22). Thirdly, at the Feast of Tabernacles, in the 7th month, was held the great feast of the gathered-in harvest, the final acknowledgment of the bounty of God in the fruits of the year (xxiii. 16).—Besides these public offerings of first-fruits on the part of the entire people, individual Jews were bound to private offerings, each on his own behalf. 1: A cake of the first dough of the year was to be offered to the Lord (Num. xv. 21). 2: The 'first of all the fruits' were to be placed in a basket, and carried to the appointed place, where the basket was to be offered with a prescribed form of words, commemorative of the sojourn of Israel in Egypt, and of his deliverance by the strong hand (Deut. xxvi. 2 and foll.). All these offerings were divided into two classes—the first, called *Bicurim*, comprised the various kinds of raw produce, of which, though the law seems to contemplate all fruits, seven sorts only were considered by the Jewish doctors to fall under the obligation of first-fruit offering—viz., wheat, barley, grapes, figs, pomegranates,

FIRTH.

olives, and dates. The law lays down no rule as to the quantity of the first-fruit offering; and many questions regarding it have been raised by the commentators. It was customary for the offerers to make their oblations in companies of 24, and with a singularly striking and effective ceremonial.

The second class of first-fruit offerings, called *Terumoth*, comprised the produce of the year in the various forms in which it is prepared for human use, as wine, wool, bread, oil, date-honey, dried onions, and cucumbers.—Under the kings, and again after the captivity, much laxity crept into the observance of this practice, which Nehemiah labored to revive in its primitive exactness. Offerings analogous to the Jewish first-fruits became usual very early in the Christian Church, as is clear from a passage in Irenæus (*Adv. Hær.* b. iv. c. 17 and 34); but the extent to which the practice prevailed, and the amount and general character of the oblation, are uncertain. It appears to have been merged in the legal provision established by the emperors.

The mediæval ecclesiastical impost known under the name of *primitiæ*, or first-fruits, and sometimes of *annates* or *annalia*, was entirely different. By the word in its mediæval and modern sense is meant a tax imposed by the popes on persons presented directly by the pope to those benefices which, by the canonical rules, or in virtue of privileges claimed by them, fall within the papal patronage. Persons so presented were required to contribute to the Roman see the first-fruits (that is, the income of the first year) of their benefice. During the residence of the popes at Avignon, when the papal necessities compelled the use of every means for eking out a precarious revenue, the impost was sought to be extended to every benefice; and this claim was the subject of many contests, especially in Germany and in England, where the claim, so far as regarded direct papal presentation, had existed from the reign of King John. Henry VIII., by two successive statutes, withdrew the right of first-fruits from the pope, in order to transfer it to the king; and he established a special court for the administration of first-fruits, which, however, was soon disused. In the reign of Anne, the revenues arising from this impost in England were vested in a Board, to be applied for supplementing the incomes of small benefices. A similar change was introduced in Ireland by the 2 Geo. I. c. 15; but in the latter kingdom the payment was entirely abolished by the 3 and 4 Will. IV. c. 27. In France, this tax was abolished by the 'Pragmatic Sanction' enacted at Bourges 1438, and subsequently by the *Concordat* of Leo X. with Francis I., 1512. In Spain, it ceased partially in the reign of Ferdinand and Isabella, and finally under Charles V. In Germany, it formed one of the first among the *Centrum Gravamina* presented to the emperor 1521, and the claim ceased altogether from that period.

FIRTH, *n.* *fërth*, often spelled FRITH, *n.* *frìth* [Icel. *ffjörðr*; Dan. *ffjörd*, an arm of the sea; Gael. *frìth*, small,

FISCAL—FISCHART.

little: L. *frētum*, a narrow sea]: the mouth of a river widening into an arm of the sea; any narrow passage of the sea; a strait. *Note*.—Skeat says FRITH is connected with L. *portus*, a haven, Gr. *porthmos*, a ferry, and not with L. *frētum*, and that the original sense was 'ferry.'

FISCAL, a. *fisk'äl* [OF. *fiscal*—from OF. *fisgue*, the public purse—from L. *fiscus*, a basket of rushes, a great money-bag; It. *fisco*]: pertaining to the public treasury or revenue: N. revenue; exchequer; in *Scot.*, a public officer who prosecutes in certain criminal cases, usually called the *procurator-fiscal*. FISCAL LANDS, lands, among the Franks, set apart for the use of the sovereign, to support his dignity, and to give him the means of rewarding merit or valor, for which purpose they were granted by him to his subjects, on condition of personal service to be rendered him in the field. FISCAL YEAR, the financial year of a government. In the United States, for all money accounts, appropriations, etc., the year begins July 1, and ends June 30 following; except that for the accounts of the sec. of the senate, for compensation and travelling expenses of senators, the fiscal year extends to and includes July 3.

